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INDUSTRIES

OF MARYLAND

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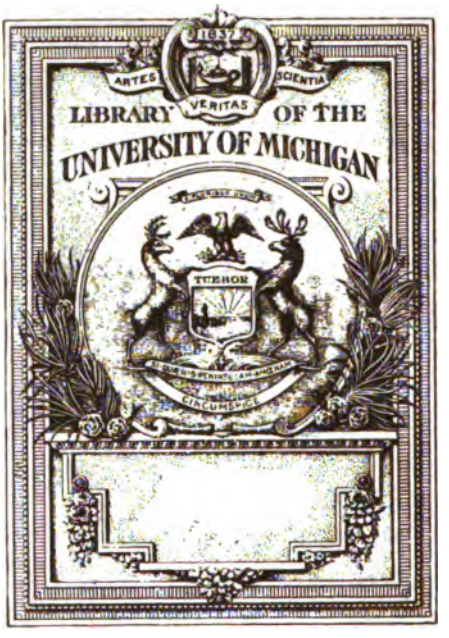

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PLATE I. A SOURCE OF BALTIMORE VENEERS.

Hundreds of walnut logs are waiting conversion to first-quality furniture veneers and gun stocks.

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MARYLAND STATE BOARD OF FORESTRY

EDWARD B. MATHEWS
Executive Officer

F. W. BESLEY
State Forester

THE WOOD-USING INDUSTRIES OF MARYLAND

BY

F. W. BESLEY, State Forester

AND

J. G. DORRANCE, Assistant Forester

BALTIMORE, MARYLAND
1919

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STATE FORESTER'S OFFICE

532 NORTH HOWARD STREET

BALTIMORE

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J. GORDON DORRANCE ....ASSISTANT FORESTER
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INTRODUCTION

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INTRODUCTION

An intensive study of the wood-using industries of Maryland has been completed, and is presented in report form here. It covers one year, to September 1, 1916. This work is in line with the policy of the Maryland State Board of Forestry to extend actual cooperation and real assistance to all forest users of the State. There is probably no field where thorough investigation would develop more of actual interest and public value or offer a more intimate portrayal of Maryland's essential industries.

In 1909, the State Board of Forestry, in co-operation with the Federal Government, made a study of the wood-using industries of the State in operation at that time. This resulted in a report issued in 1910. A limited edition was published, and the demand which it created showed that further research along these lines could profitably be undertaken when opportunity offered.

The data here presented was collected just prior to the disturbance of normal conditions generally through participation by this country in the war. Therefore, conditions set forth here are those of average times, and have a greater value than would have been the case for any subsequent period to now.

Combined with "The Forests of Maryland," published in 1916, this report gives a complete, detailed record of forest conditions, timber production, and wood manufacture. It takes up more than a mere study of the amounts and varieties of woods employed in one industry and another, and it goes deeper than a census of forest industries. It shows not only what is used and why, but also prices demanded, consumption, production, factors of forest finance, conditions of employment in forest industries, and local significance of each forest use for every corner of the State. Manufacturing is treated in detail, and waste in wood has been considered practically.

Some interesting facts are shown. The lumber cut in 1916 amounted to 110,000,000 board feet, valued at approximately

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$1,850,000, while the quantity of lumber consumed by the wood-using industries was 345,000,000 feet, valued at $7,888,000. Maryland distinctly stands out as a *manufacturing* State Probably one of the most significant features in the report is the greatly increasing use of woods that in the past have been considered of low quality and often too poor for manufacture. Red gum, beech, birch and red maple are among the varieties which have shown surprising increase in consumption. Generally speaking, the first few varieties of wood in order of importance are much the same now as in 1909. Southern yellow pines, the oaks, cypress and tulip poplar are still leaders. Black gum shows surprisingly the result of increased demand, higher prices and diminishing forest areas. From a consumption of 85,000 board feet in 1909 in Maryland, 8,465,000 feet of black gum are now used annually in local forest industries. Other woods, that were called cheap, show also to some extent the same change.

On the other hand, there have been some declines. Sycamore and cottonwood have almost dropped from the list, to so small an extent are they used. This is probably due to difficulty in securing them and the fact that other woods, more easily obtainable, will do as well or better. Hemlock, a tree once plentiful in the great forests of Western Maryland, was, in 1916, but twenty-first in the list of woods used. From 2,200,000 feet and the fourteenth place in 1909, it has now dropped to 890,000 board feet annually. This demonstrates very plainly that the original timber is gone from the forests of Maryland, and that improved handling and heavy planting, better methods and less waste become more necessary with the passing of each year. Maryland, with nearly 300 distinctly wood-using industries, her 11,000 employees of these manufactories, and finished forest products aggregating millions, cannot afford to fail of encouraging by every practical means this source of constant profit and daily livelihood to much larger elements of the State than even appear from these figures.

In this report, an occasional minor industry has been grouped with others, so that information personal to them and confidentially obtained could in no way prove embarrassing in use, for it is desired that this report should be a real help to all of Maryland's forest owners and wood users, more especially those who have contributed so largely to make this work successful. Of several hun-

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PLATE II. FIG. 1—THE BOX MILL.

This plant—Worcester County, Md.—manufactures packages from loblolly pine. Large factories of this type use great amounts of yellow pine in making products of much value and importance to the Eastern Shore.

PLATE II. FIG. 2—SHIPPING BOX SHOOKS.

Worcester County, where this was taken, makes great quantities of crates and boxes, a large part of which reach market by the water route. Schooners often handle the shooks.

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dred Maryland firms approached in this investigation, there were only two which were unwilling to co-operate, and genuine interest in the practical features of this work has been apparent throughout the State.

Particular thanks are due the United States Forest Service for illustrations, which add much to the value of the work.

The data presented here is authoritative. It is localized, and it is new. As such, the book is recommended to those of Maryland who have an interest in the forests or their more important uses.

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PART I

INDUSTRIES

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PLATE III. FIG. 1— SHOOKS.

Softwood boxes and crates—sides, tops and bottoms—packed as shooks, are shown in the factory where they are made.

PLATE III. FIG. 2— BOXES.

From card index containers to dry goods packages, some types are shown here.

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THE WOOD-USING INDUSTRIES OF MARYLAND

The industries producing wood and timber maintain a greater number of establishments than any other in this State, and normally there is but one industry in Maryland where the value of the products, and the number of dependent wage-earners, exceed those of the lumber business and allied trades. Together, they operate 1,168 establishments and employ 16,790 men. They manufacture rough lumber (shingles, cooperage materials), finished lumber (sash, doors, blinds and interior finish) and wooden boxes. Additional operators produce ties, poles, posts and similar forest products, while those allied concerns which carry further the manufacture of these wood products include ship building, furniture, musical instruments, carriages, wagons and automobiles, cigar boxes, baskets, cooperage and miscellaneous manufactures. In explanation, it may be said that while the last-named industries do not use wood exclusively in making up their output, they supply products, nevertheless, in which wood constitutes a large share of all the raw material converted.

A thorough investigation begun in 1909 by the Maryland State Board of Forestry and the United States Forest Service disclosed that Maryland wood-using or manufacturing industries then in operation were annually converting into finished products 284,346,985 feet of raw material in the shape of rough lumber. Twenty-per cent., approximately, was State-grown, and 80 per cent. supplied from States and countries outside. By 1916, Maryland was producing but 17 per cent. of the total, and other changes will appear as the two investigations are compared. Total wood consumption, for instance, rose in this short time 21 per cent. Average cost has gone from $20.67 per thousand board feet to $22.86.

Maryland manufacturers of wood were then, in 1909, deriving their supplies of this commodity from 34 different States and 13 foreign countries. Twenty-six of the 54 species of wood reported

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land, in addition to ranking third in the State. Several things have naturally determined the centering of these establishments. In the case of Baltimore these reasons are very obvious—labor, markets, means of transportation and adequate facilities of every sort immediately at hand. For Hagerstown also the reasons are quite apparent, since it possesses, next to the section just mentioned, the finest railway transportation of any section of the State. Washington County itself has the second largest county mileage in steam and electric roads, and Hagerstown, at its center, is reached by a network of lines from points outside. This unusual accessibility by rail also tends to promote conditions of labor and the supply of laborers, while a further advantage which should not be undervalued lies in the large supplies of wood and timber which are constantly being cut in the mountain country to the west, not only in the two Maryland counties of Garrett and Allegany, but in the adjoining States of Pennsylvania and West Virginia. Incidentally, the timber purchased locally in the Hagerstown valley, because of the favorable conditions under which it grows, is of exceptional grade and adaptability.

Salisbury possesses decided advantages in combined water and rail shipment. It is convenient to the pine-producing centers of the Southern seaboard, from which is drawn the great bulk of its rough lumber for manufacture, and Wicomico County itself has woodland aggregating 46 per cent. of its total area. It is nearby other counties with still larger areas of timber, all conducive to supplying material for industries of far-reaching importance.

As was pointed out in the early part of the chapter, the industries producing wood, with those manufacturing products of wood and therefore dependent to a certain extent upon the forest resources, together represent various business and industrial activity of State-wide magnitude. They are industries which we could hardly be without, and which we could therefore afford to perpetuate. In this connection a glance at the annual cut, yearly growth and present stand of the timber in Maryland is quite revealing. It is probable that the average annual increment of wood per acre for all the forests of the State cannot exceed 15 cubic feet. The total growth, upon the basis of this consumption, is 33,420,690 cubic feet; the annual cut is at present 46,949,181 cubic

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PLATE IV. FIG. 1—DORCHESTER PLANING MILL.

Boxes and planing mill products lead locally. This Hurlock mill is typical of the modern, effective plant usually found.

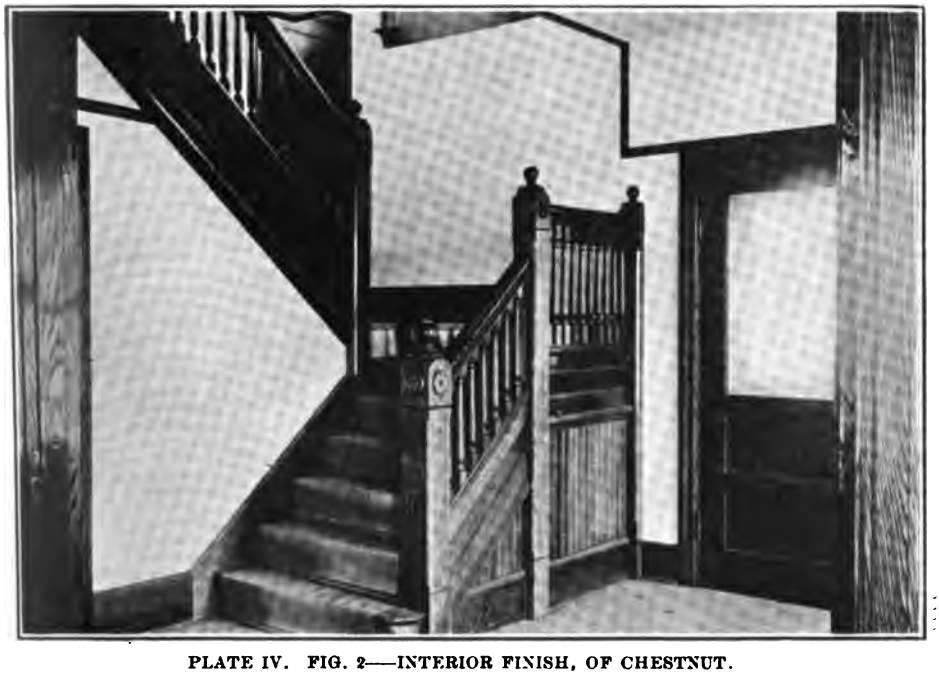

PLATE IV. FIG. 2—INTERIOR FINISH, OF CHESTNUT.

This picture demonstrates that blighted chestnut is good for something, and that this wood deserves wide use in finishing, fixtures, and planing mill products.

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TABLE 2—MEN EMPLOYED IN MARYLAND, BY INDUSTRIES.

Industry.	Baltimore.		Balance of State.		Total for State.	
	No. Men.	No. Plants.	No. Men.	No. Plants.	No. Men.	No. Plants.
1. Ship and boat building	1,901	17	173	10	2,074	27
2. Boxes and crates, packing	1,188	24	646	45	1,834	69
3. Planing mill products	942	27	415	44	1,357	71
4. Furniture	716	15	575	9	1,291	24
5. Instruments, musical	628	3	275	1	903	4
6. Vehicles and vehicle parts	509	46	75	6	584	52
7. Brushes	200	1	350	1	550	2
8. Car construction	260	2	200	1	460	3
9. Baskets	25	2	356	23	381	25
10. Fixtures	306	8	66	3	372	11
11. Tanks and silos, cooperage	135	7	102	11	237	18
12. Woodenware and novelties	175	5	19	3	194	8
13. Toys	175	2	----------	----------	175	2
14. Boxes, cigar	165	4	----------	----------	165	4
15. Caskets and coffins	115	1	----------	----------	115	1
16. Picture frames and mouldings	66	3	----------	----------	66	3
17 Portable houses	60	1	----------	----------	60	1
18. Trunks, valises, luggage	48	3	----------	----------	48	3
19. Molds and patterns	7	2	----------	----------	7	2
The State	7,621	173	3,252	157	10,873	330
Average men per plant	44	----------	21	----------	33	----------
*Total firms listed	----------	164	----------	118	----------	282

* 282 represents total wood-using industries in Maryland.

330 also represents the 282 firms, some of which, however, manufacture more than one wood product, and are therefore divided accordingly and indicated more than once.

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feet, and the amount of timber now standing 317,871,408 cubic feet. The annual growth is but 71 per cent. of the total production, which in turn amounts yearly to 15 per cent. of the whole. Very little reflection or calculation is necessary to indicate that timber is being cut much faster than it is grown. It is a good deal of a certainty that the annual cut will not appreciably diminish for some time to come, and it is equally sure that under the present conditions and prevalent methods the annual growth will not be greatly increased.

There is but one practical solution, and that is more efficiency in forest management and greater care in the removal of the crop. Through the former there is little doubt that in a comparatively few years' time the production of Maryland forests might be raised 100 per cent. The Board has studied this phase of State forestry very carefully. It has already assisted several hundred local timber owners to regulate their cut, secure sale of products and augment their production. But these hundreds should be thousands, and the Board is fully prepared to undertake such problems in every portion of the State at the instance of any woodland owner.

Better management means increased production; with increased production there will follow increase of manufacturing. Improved methods, beginning in the woodlot or larger tract of forest land, will extend and be felt through the whole field of production and operation, and with those conditions put in effect, the wood-using industries of Maryland, already of commanding importance, should steadily advance in value and give employment to even greater numbers.

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TRANSPORTATION, MARKETS AND GENERAL CONDITIONS IN THE LUMBERING AND WOOD-MANUFACTURING INDUSTRIES OF MARYLAND.

Transportation. Waterways.—Maryland's total area is 12,210 miles, of which 2,319 square miles, or 19 per cent., is water. The great area in waterways is made up of 1,203 square miles in the Chesapeake Bay proper, 93 in Chincoteague Bay and 1,023 in other estuaries. From the lower end of the Chesapeake, where the Maryland State line runs from below Somerset County, on the east, to Smith Point, Northumberland County, Virginia, on the west, it is approximately 130 miles up the center of the Bay to its end in Cecil County. It is a great waterway, the largest inlet on the Atlantic Coast of the United States. At the entrance it is 12 miles across, later broadening to an average width of 20 miles, and a maximum of 40.

The Eastern and Western Shores of Maryland are veritably honey-combed by navigable, tide-water streams, while the Potomac River, one of the most important, follows the southern and southwestern boundaries of Maryland throughout. As far as Washington it is navigable by steam vessels, and from there by smaller boats and barges to Chain Bridge, near the District line. These waterways give Maryland an enormous amount of deep-water transportation. They were important factors in the State's settlement, and they are as invaluable now.

Natural facilities for water transportation are also supplemented by several which are artificial. A canal, the Chesapeake and Delaware, connects the upper Chesapeake with Delaware River; another runs from Georgetown, near Washington, to Cumberland, in Western Maryland. The latter, the Chesapeake and Ohio Canal, is an old and important link in the State's waterways, for this idea, of connecting the Potomac at tide-water with the nearest point attainable to the headwaters of the Ohio, originated with George Washington before he became President. It is 185 miles in length, and fed throughout by the Potomac River.

Railroads and Highways.—There are over 1,400 miles of railway in Maryland, including the Annapolis Short Line; Baltimore,

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Chesapeake & Atlantic; Baltimore & Ohio; Chesapeake Beach; Cumberland Valley; Cumberland & Pennsylvania; Emmitsburg; George's Creek & Cumberland; Hagerstown & Frederick; Jennings Bros.; Maryland, Delaware & Virginia; Maryland & Pennsylvania; New York, Philadelphia & Norfolk; Norfolk & Western; Northern Central; Pennsylvania; Philadelphia, Baltimore & Washington; Washington, Baltimore & Annapolis; Washington, Potomac & Chesapeake; and Western Maryland systems.

In addition, there are 1,500 miles of State roads improved with shell, concrete, and macadam, forming main lines of traffic, and connecting all of the county seats. Facilities are ample in nearly every district not accessible by the water route, and in many parts boat and train service are combined to give adequate shipping advantages. There should not be a section of Maryland, from the truck gardens of the Eastern Shore to the mountain woodlands of Western Maryland, which is inaccessible to the great markets near at hand.

Markets.—Maryland is a State possessing to a great degree the undoubted advantage of markets which are numerous, well distributed and profitable. Within a radius of 190 miles of Baltimore City are New York, Philadelphia, Washington, Richmond and Wilmington, cities which, taken with Baltimore, include more than 8 per cent. of the country's total population.

It is also noteworthy that these great markets, without exception, are available by water as well as by rail. Were these advantages and the existing means of transportation not enough, the State itself has within its borders several relatively important markets and centers of distribution. Baltimore, in Central Maryland; Salisbury, Pocomoke City, Cambridge, Easton and others on the Eastern Shore; Cumberland, Hagerstown and Frederick, in Western Maryland, are all centers of wood-manufacturing plants which depend, to some extent, upon local forest supplies.

Certain products, particularly in an unmanufactured state, find their way to these and other points for distribution, and lumber and lath, with cordwood and charcoal, have their greatest demand in the larger communities. There are markets in Maryland which are available to all the forest products of the State. These markets have shown consistent growth, though still susceptible of profitable development.

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INDUSTRIES.

BOXES AND CRATES.

Nearly one-half of the wood used in all industries—49 per cent.—went into boxes, crates and packing. Of this, 20 per cent. was home-grown. This industry used the lowest grade of wood of any, the average price per thousand being less than $15. Sixteen different kinds of wood were reported, but yellow pine constituted by far the largest amount used—91 per cent. The industry is confined largely to Baltimore City and to the Eastern Shore peninsula. In the latter, the sides, tops and bottoms of the boxes are cut into shape and assembled, but shipped for convenience in a

TABLE 3—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

BOXES AND CRATES, PACKING.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	33,898,000	120,932,000	--------	154,830,000	91	$14.80	$2,291,341
2. Black gum	70,000	7,400,000	--------	7,470,000	4	13.30	99,380
3. Red maple	--------	1,500,000	--------	1,500,000	1	18.00	27,000
4. Tulip poplar	--------	1,394,000	--------	1,394,000	1	16.37	22,816
5. Red gum	75,000	1,300,000	--------	1,375,000	1	15.37	21,130
6. Basswood	--------	1,355,000	--------	1,355,000	.7	19.83	26,875
7. Cypress	--------	1,025,000	--------	1,025,000	.5	16.46	16,875
8. E. white pine	--------	805,000	--------	805,000	.5	26.07	20,983
9. Chestnut	180,000	75,000	--------	255,000	.1	15.39	3,925
10. W. white pine	--------	200,000	--------	200,000	.1	25.00	5,000
11. Cotton gum	--------	175,000	--------	175,000	.1	29.86	5,225
12. Oak species	5,000	60,000	--------	65,000	--------	14.46	940
13. Red cedar	--------	27,000	--------	27,000	--------	40.00	1,080
14. Cucumber	--------	15,000	--------	15,000	--------	39.00	585
15. Hard maple	--------	5,000	--------	5,000	--------	80.00	400
16. Cottonwood	--------	5,000	--------	5,000	--------	30.00	150
Totals	34,228,000	136,273,000	--------	170,501,000	100	$14.92	$2,543,705

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knocked-down state, called box shooks, the user nailing them together. Those made in Baltimore are mostly of the set-up kind ready for use, such as are demanded by the manufacturers of merchandise. For packing provisions woods such as gum, maple and tulip poplar, which do not impart an odor to the contents, are preferred. White pine is the favorite for canned goods and merchandise.

PLANING MILL PRODUCTS.

This industry used 23 per cent. of all the wood employed by Maryland manufacturers, and the total cost of the material at the factory was nearly equal to that of boxes and crates, the highest

TABLE 4—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

PLANING MILL PRODUCTS.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	4,667,000	53,940,000	--------	58,607,000	73	$20.97	$1,228,863
2. Cypress	--------	7,955,000	--------	7,955,000	10	37.83	300,965
3. Oak species	592,000	3,506,000	--------	4,098,000	5	36.97	151,515
4. E. white pine	89,000	2,307,000	10,000	2,406,000	3	60.98	146,718
5. Basswood	--------	2,100,000	--------	2,100,000	3	32.30	67,840
6. Tulip poplar	108,000	1,221,000	--------	1,329,000	2	37.36	49,654
7. Chestnut	131,000	1,193,000	--------	1,324,000	2	35.20	46,611
8. W. white pine	--------	705,000	--------	705,000	1	40.39	28,475
9. Hemlock	50,000	640,000	--------	690,000	1	18.41	12,700
10. Hard maple	--------	432,000	--------	432,000	--------	32.75	14,150
11. Eastern spruce	--------	395,000	--------	395,000	--------	33.37	13,180
12. Red gum	90,000	77,000	--------	167,000	--------	22.84	3,815
13. Douglas fir	--------	155,000	--------	155,000	--------	48.55	7,525
14. Mahogany	--------	--------	108,000	108,000	--------	140.97	15,235
15. Birch species	--------	88,000	--------	88,000	--------	51.14	4,540
16. Black gum	30,000	30,000	--------	60,000	--------	35.00	2,100
17. Black walnut	25,000	25,000	--------	50,000	--------	65.00	3,250
18. Sugar pine	--------	50,000	--------	50,000	--------	45.00	2,250
19. Ash species	--------	40,000	--------	40,000	--------	36.25	1,450
20. Wild black cherry	7,000	6,000	--------	13,000	--------	75.00	975
21. Redwood	--------	1,000	--------	1,000	--------	55.00	55
Totals	5,789,000	74,866,000	118,000	80,773,000	100	$26.02	$2,101,855

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PLATE V. FIG. 1—THE WOODEN TANK.

These staves are of white pine, now assembled in finished form.

PLATE V. FIG. 2—THE WOODEN SILO.

What is a farm without a silo? Each year shows it increasingly essential; many of the best silos are of wood.

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of all industries, and it was also next to that in value. Yellow pine constitutes 73 per cent. of the amount used, while cypress was 10 per cent. In all, 21 different woods were used, but only 7 per cent. were home-grown. Nearly one-third of the lumber production of the United States is demanded by this industry.

TANKS AND SILOS, COOPERAGE.

This industry used thirteen different kinds of wood and 6 per cent. of all the woods consumed by manufacturers. Yellow pine heads the list with 54 per cent., oak 29 per cent., Douglas fir 10 per cent. The average cost was $33.50 per thousand, California redwood costing the most, while black gum and ash were the lowest-priced woods. Twenty-four per cent. of the amount used was home-grown. The quantity of Western wood is notable, since Douglas fir constituted 10 per cent. of the total amount of wood used. For this class of manufacture, straight-grained, durable woods are required.

TABLE 5—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

TANKS AND SILOS, COOPERAGE.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	2,380,000	8,037,000	--------	10,417,000	54	$29.07	$302,817
2. Oak species	1,963,000	3,634,000	--------	5,567,000	29	41.81	232,764
3. Douglas fir	--------	2,000,000	--------	2,000,000	10	31.50	63,000
4. Cypress	--------	470,000	--------	470,000	2.5	45.32	21,300
5. E. white pine	--------	300,000	--------	300,000	2	36.50	10,950
6. Red gum	133,000	132,000	--------	265,000	1	25.44	6,742
7. Red maple	134,000	--------	--------	134,000	1	29.89	4,005
8. Redwood	--------	100,000	--------	100,000	.5	45.50	4,550
9. American elm	--------	63,000	--------	63,000	--------	33.33	2,100
10. Ash species	--------	20,000	--------	20,000	--------	15.00	300
11. Black gum	--------	10,000	--------	10,000	--------	15.00	150
12. Beech	--------	7,000	--------	7,000	--------	32.00	224
13. Hickory species	--------	7,000	--------	7,000	--------	32.00	224
Totals	4,580,000	14,780,000	--------	19,360,000	100	$33.50	$649,126

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Cooperage includes two classes of barrels and kegs — tight cooperage comprises barrels and kegs used as liquid containers and requires the higher grade of material, such as oak, Douglas fir, cypress and redwood; while what is known as slack cooperage includes barrels for dry articles, as flour, sugar, apples, potatoes, and kegs for holding nails, bolts, horse shoes, etc.

Manufacturers of slack cooperage are likely to enjoy good markets and steady trade indefinitely. For some time, due to a variety of obvious reasons, the tight cooperage industry has suffered. Now, with containers of alcoholic liquids in ever-diminishing demand, there is in many centers an actual crisis for the makers of tight barrels and kegs. This is something which the manufacturer can hardly alter. He can hope only for changed trade conditions, or himself convert his business to conform to other and keener demands.

CAR CONSTRUCTION.

Wood is largely being displaced by metal in the construction of cars, but even with the large substitution a considerable amount

TABLE 6——SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

CAR CONSTRUCTION.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	---------	9,890,000	--------	9,890,000	64.5	$32.44	$320,830
2. Oak species	525,000	2,562,000	--------	3,087,000	20	24.08	74,190
3. Tulip poplar	---------	800,000	--------	800,000	5.5	60.00	48,000
4. Douglas fir	---------	600,000	--------	600,000	4	35.67	21,400
5. Cypress	---------	535,000	--------	535,000	3.5	46.82	25,050
6. Hemlock	---------	200,000	--------	200,000	1.5	26.00	5,200
7. E. white pine	---------	100,000	--------	100,000	.5	50.00	5,000
8. Ash species	---------	80,000	--------	80,000	.5	50.00	4,000
9. Mahogany	---------	---------	40,000	40,000	--------	200.00	8,000
10. Chestnut	---------	12,000	--------	12,000	--------	26.00	312
11. Wild black cherry	---------	10,000	--------	10,000	--------	120.00	1,200
12. Hard maple	---------	1,000	--------	1,000	--------	35.00	35
Totals	525,000	14,790,000	40,000	15,355,000	100	$33.40	$513,217

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PLATE VI. FIG. 1—THE TABLE FACTORY.

Manufacture of first-class wooden tables is an important branch in Maryland furniture-making.

PLATE VI. FIG. 2—STORE FIXTURES, INTERIOR FINISH.

Divers products made of many woods come from the planing mill and fixture shops.

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of wood is used. Maryland manufacturers reported 12 different kinds of wood, of which yellow pine constituted 64.5 per cent. and oak 20 per cent. The average cost was comparatively low—$33 per thousand. Only 3.5 per cent. of that used was State-grown. Yellow pine, because of its abundance, lightness of weight and good working qualities, was used largely for tops and sides of box cars, while oak was most extensively used for framing. Small quantities of other woods were used for the interior finish of coaches.

FURNITURE.

Seventeen different woods were used, of which oak constituted 54 per cent. and tulip poplar 13.5 per cent. Oak is in demand because of its hardness, beauty of grain, capacity for high polish and good working qualities. Tulip poplar is largely used for draw-

TABLE 7—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

FURNITURE

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Oak species	2,161,000	6,034,000	--------	8,195,000	54	$37.82	$309,901
2. Tulip poplar	300,000	1,727,000	--------	2,027,000	13.5	48.09	97,486
3. Chestnut	410,000	702,000	--------	1,112,000	7.5	20.62	22,927
4. Hard maple	--------	974,000	--------	974,000	6.5	25.00	24,354
5. Red maple	--------	505,000	--------	505,000	3.5	29.90	15,100
6. Basswood	--------	484,000	--------	484,000	3	24.89	12,047
7. Red gum	122,000	353,000	--------	475,000	3	29.33	13,933
8. Beech	--------	343,000	--------	343,000	2.5	22.13	7,589
9. Mahogany	--------	--------	305,000	305,000	2	129.83	39,597
10. Cypress	--------	300,000	--------	300,000	2	28.00	8,400
11. Birch species	--------	180,000	--------	180,000	1	26.33	4,740
12. Black gum	--------	90,000	--------	90,000	.5	20.00	1,800
13. Circassian walnut	--------	--------	65,000	65,000	.5	153.85	10,000
14. Ash species	8,000	54,000	--------	62,000	.5	21.94	1,360
15. S. yellow pines	--------	35,000	--------	35,000	--------	22.57	790
16. Black walnut	7,000	5,000	--------	12,000	--------	121.67	1,460
17. Wild black cherry	3,000	--------	--------	3,000	--------	25.00	75
Totals	3,011,000	11,786,000	370,000	15,167,000	100	$37.68	$571,559

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ers, shelves, etc. Nearly 20 per cent. of the wood used was Maryland-grown, including all of the cherry, most of the black walnut and a large part of the oak and chestnut.

SHIP AND BOAT BUILDING.

Ship and boat building has long been an important industry in Maryland because of the large water area of the State included in the Chesapeake Bay and its tributaries. All classes of wooden boats are built, from small pleasure boats to large barges. Fifteen different woods were used by manufacturers, of which white pine constituted 64 per cent., with oak the next in amount—26 per cent. The average price paid was $31 per thousand feet, the range being from $20 per thousand feet for red gum to $350 for teak. The expensive woods, such as teak, mahogany and lignum-vitae, were used in interior finish of expensive pleasure boats, while yellow pine and oak were the chief woods used in freight vessels.

TABLE 8—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

SHIP AND BOAT BUILDING.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	85,000	7,714,000	--------	7,799,000	64	$28.57	$222,885
2. Oak species	2,869,000	342,000	--------	3,211,000	26	33.45	107,414
3. Eastern spruce	--------	435,000	--------	435,000	4	21.84	9,500
4. Douglas fir	--------	205,000	--------	205,000	2	27.56	5,650
5. Cedar species	--------	148,000	--------	148,000	1	43.89	6,496
6. Western spruce	--------	100,000	--------	100,000	1	35.00	3,500
7. Cypress	--------	85,000	--------	85,000	.7	62.41	5,305
8. E. white pine	--------	69,000	--------	69,000	.5	75.17	5,187
9. Tulip poplar	--------	55,000	--------	55,000	.4	55.21	3,037
10. Red gum	50,000	--------	--------	50,000	.4	20.00	1,000
11. Mahogany	--------	--------	15,000	15,000	--------	216.67	3,250
12. Lignum-vitae	--------	--------	12,000	12,000	--------	156.25	1,875
13. Teak	--------	--------	9,000	9,000	--------	350.00	3,150
14. Tamarack	--------	5,000	--------	5,000	--------	50.00	250
15. Hard maple	--------	2,000	--------	2,000	--------	42.00	84
Totals	3,004,000	9,160,000	36,000	12,200,000	100	$31.08	$378,533

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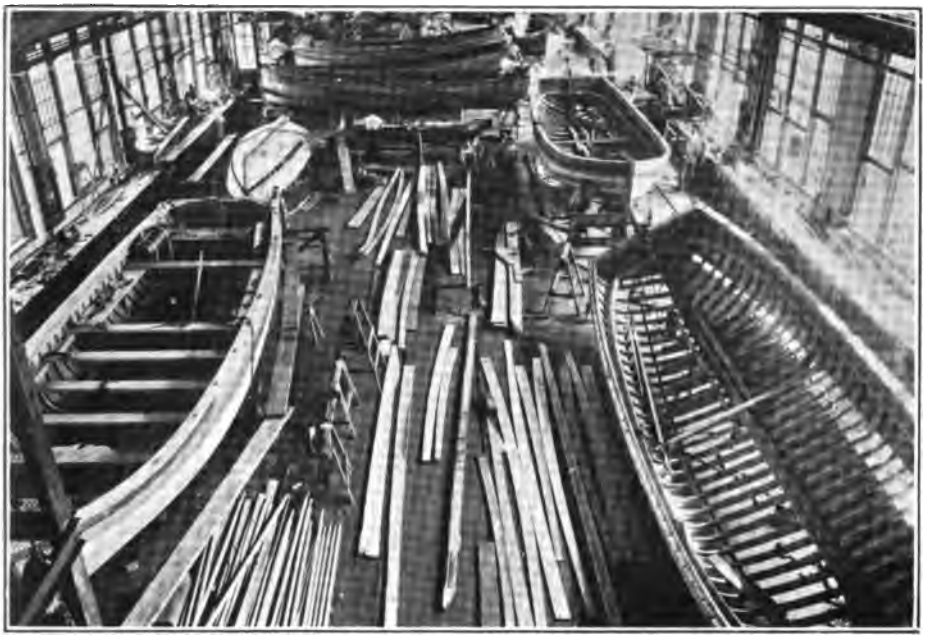

PLATE VII. FIG. 1—BOAT SHOP INTERIOR.

In small boats and large ships, wood is filling a need again. It is not only handy for pleasure craft; the all-wood boat once more follows the ocean lanes.

PLATE VII. FIG. 2—WORCESTER COUNTY SHIPYARD.

Shipbuilding is coming into its own again, and Maryland has its share. The wooden bottom is now in demand.

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Boat building, once of prime importance to Maryland, as indeed to many other seaboard States, is now coming into its own again. Baltimore firms which but two or three years ago did a very small amount of repair work—chiefly, too, on vessels of other nations—are at present making tremendous strides, and show phenomenal growth. In part, it is a product of the war, but America is naturally a ship-constructing nation, and this industry seems likely not only to continue as it is, but indeed to register still higher records.

BASKETS.

The basket business is an important one in Maryland because of the large quantity used by the truckers in shipping their products. In fact, Maryland is one of the leaders of the Atlantic seaboard in baskets. The baskets are made from thin pieces of wood, cut on veneer machines; and in the case of round baskets, the tops and bottoms are generally made of pine. Red gum is the favorite wood for baskets and constitutes 70 per cent. of all the wood used. Eighty-five per cent. of this was home-grown, and 70 per cent. of all wood used was grown in Maryland. The average cost was $19.40 per thousand feet for crates and packing boxes.

TABLE 9—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.*

BASKETS

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Red gum	3,935,000	665,000	--------	4,600,000	70	$17.61	$80,995
2. Tulip poplar	260,000	230,000	--------	490,000	7.5	17.09	8,375
3. Black gum	160,000	250,000	--------	410,000	6	17.20	7,050
4. Hard maple	---------	340,000	--------	340,000	5	36.40	12,375
5. American elm	25,000	275,000	--------	300,000	4.5	22.83	6,850
6. Beech	5,000	155,000	--------	160,000	2.5	21.78	5,515
7. Red maple	75,000	80,000	--------	155,000	2.5	26.77	4,150
8. S. yellow pine	100,000	---------	--------	100,000	1.5	15.50	1,550
9. Birch species	---------	20,000	--------	20,000	.5	37.50	750
10. Basswood	10,000	---------	--------	10,000	-------	17.00	170
Totals	4,570,000	2,015,000	--------	6,585,000	100	$19.40	$127,780

* Does not include willow withes.

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FIXTURES.

It is difficult in some cases to distinguish between and separate fixtures from the products of furniture manufactories. Fixtures in this report constitute such furnishings of stores, saloons, lodge and club rooms, offices and churches as are not usually movable. This industry used only 2 per cent. of wood consumed. Of the amount used, 28 per cent. was Maryland grown, although of the two principal species given—oak and locust—over half of the former and all of the latter were home-grown. Chestnut, the next wood in importance and widely distributed in the State, was all imported. The average cost of the woods is $42.60 per thousand feet, which is comparatively low for the grade of material required. The low cost, however, is due to the fact that locust, which con-

TABLE 10—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

FIXTURES.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Oak species	540,000	911,000	--------	1,451,000	25	$33.80	$49,000
2. Locust	1,075,000	----------	--------	1,075,000	18.5	9.30	10,000
3. Chestnut	---------	725,000	--------	725,000	12.5	27.43	19,887
4. S. yellow pines	---------	510,000	--------	510,000	9	30.20	15,400
5. Tulip poplar	---------	498,000	--------	498,000	9	41.58	20,705
6. Birch species	---------	435,000	--------	435,000	8	46.90	20,400
7. Mahogany	---------	----------	377,000	377,000	6	134.28	50,625
8. Basswood	---------	118,000	--------	118,000	2	30.64	3,626
9. Black walnut	1,000	117,000	--------	118,000	2	117.71	13,890
10. Black gum	---------	105,000	--------	105,000	2	35.00	3,675
11. Hard maple	---------	90,000	--------	90,000	1.5	50.00	4,500
12. Red gum	---------	55,000	--------	55,000	1	45.00	2,475
13. Red maple	---------	55,000	--------	55,000	1	35.00	1,925
14. Circassian walnut	---------	----------	50,000	50,000	1	325.00	16,250
15. Cypress	---------	45,000	--------	45,000	1	45.00	2,025
16. Wild black cherry	25,000	15,000	--------	40,000	.5	61.88	2,475
17. Rosewood	---------	----------	25,000	25,000	-------	350.00	8,750
18. E. white pine	---------	10,000	--------	10,000	-------	65.00	650
Totals	1,641,000	3,689,000	452,000	5,782,000	100	$42.60	$246,308

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PLATE VIII. FIG. 1 -- THE WOODEN SCHOONER.

The building of wooden ships is not yet a lost art; in fact, it promises again to be a live and growing industry.

PLATE VIII. FIG. 2-- A LEADING INDUSTRY.

The days of the Baltimore clipper are past, but its successor is requiring daily more material and men. Huge yards are going up. Wood enters every craft, sometimes little else.

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stituted 18.5 per cent of the amount of wood used, cost less than any other wood utilized by Maryland manufacturers in any industry. This was purchased in the log and was used largely in the manufacture of insulator pins.

CASKETS AND COFFINS.

Six different woods were reported by Maryland manufacturers as going into rough boxes, caskets and coffins. Tulip poplar and buckeye constitute 42 per cent., followed closely by white pine, chestnut, basswood and oak. While the amount of wood used by the industry was comparatively small, the cost per thousand was relatively high—$48.33 per thousand—due to the quality demanded. Of these six woods that were used none were State-grown.

TABLE 11—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

CASKETS AND COFFINS.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Tulip poplar	--------	1,000,000	--------	1,000,000	21	$60.00	$60,000
2. Yellow buckeye	--------	1,000,000	--------	1,000,000	21	50.00	50,000
3. E. white pine	--------	750,000	--------	750,000	15.5	33.00	24,750
4. Chestnut	--------	750,000	--------	750,000	15.5	35.00	26,250
5. Basswood	--------	700,000	--------	700,000	14.5	50.00	35,000
6. Oak species	--------	600,000	--------	600,000	12.5	60.00	36,000
Totals	--------	4,800,000	--------	4,800,000	100	$48.33	$232,000

BRUSHES.

Brush-making in Maryland centers in two places, Baltimore and Frederick. At both there are manufacturers of considerable importance, and their product is one which is sold in all parts of the country and world.

The production of wooden brush-backs, and of high-quality brushes of all sorts, is specialized. Intricate machinery, skilled workers, and numerous kinds of raw materials are requities for a large output. The fibres of which the bristles are fashioned are

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of vegetable growths gathered in all parts of the world, from Mexico and tropical America to the islands of the East Indies.

In Baltimore, but little manufacturing is done outside of brush-backs. For these beech exclusively is used. But in Frederick there is a tremendous output of finished brushes in very great variety, and for it beech, birch and maple are used in considerable amount. A grade of No. 2 common is usually employed, and practically all of the wooden brush material that is manufactured in Maryland is cut in West Virginia.

TABLE 12—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

BRUSHES.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Beech	.....	3,500,000	.....	3,500,000	78	$20.50	$71,750
2. Birch species	.....	500,000	.....	500,000	11	21.00	10,500
3. Hard maple	.....	500,000	.....	500,000	11	23.50	11,750
Totals	.....	4,500,000	.....	4,500,000	100	$20.89	$94,000

This industry is an interesting one, and one which shows little wood waste, something still sufficiently of a novelty to gain attention. Sizes and shapes in brush-backs are widely diversified, of course. Large material is shaped and cut in styles suitable for floor and scrubbing brushes, mop blocks and handles. Smaller stuff is readily converted into dowels and even corn-popper handles, and, of course, the greater part goes into the backs of small brushes. For brushes cover a large field, and in Maryland practically every sort is made, ranging from the large size suitable for swabbing up the deck of a battleship to that which is an adjunct to the toilet table. Maryland brushes stand high in the country-wide trade, and command an expanding market.

VEHICLES AND VEHICLE PARTS.

This includes both motor and horse-drawn vehicles. Of the 13 different woods reported by the industry, hickory constituted

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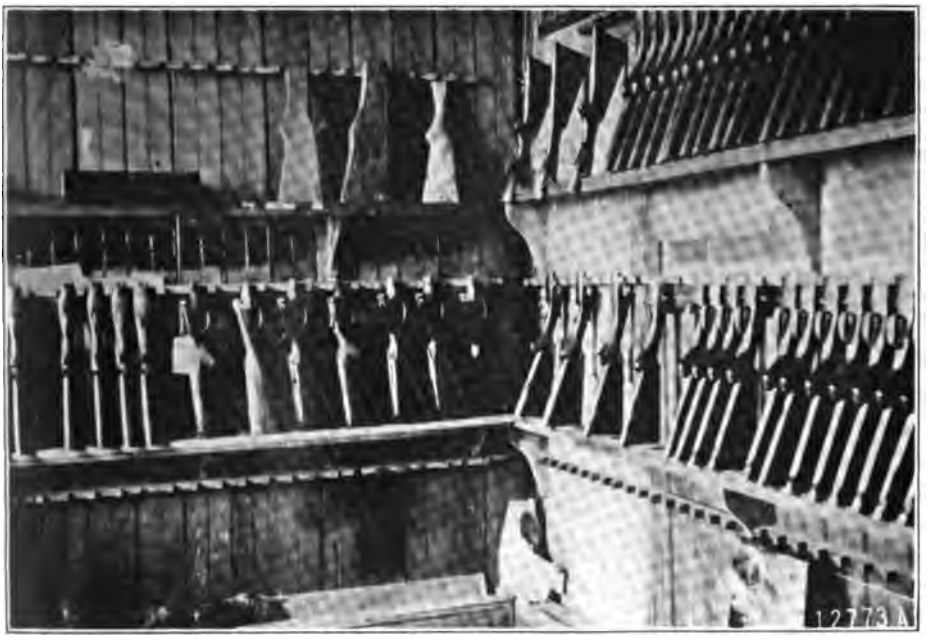

PLATE IX. FIG. 1—GUN STOCKS—ROUGH AND FINISHED.

This product, needed through recent events as never before, requires high grades of American and Circassian walnut. Supply has not kept pace with demand.

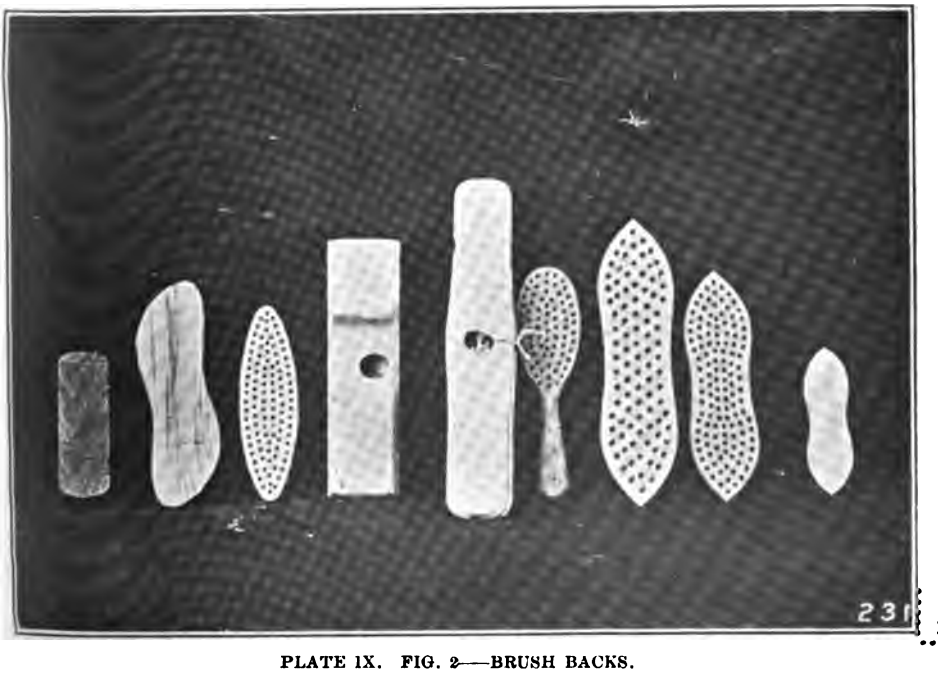

PLATE IX. FIG. 2—BRUSH BACKS.

These backs—of beech, birch and maple—are ready for insertion of the bristles. The industry is important to Maryland, and uses much hardwood of good quality.

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nearly 75 per cent. of the total amount used, followed by oak—19 per cent.—with tulip poplar and ash in smaller proportion. Hickory is a favorite wood for spokes, rims and gear parts, followed closely by white oak ,with tulip poplar the chief wood for bodies of wagons, carriages and automobiles, and ash in use extensively for frame parts. Red gum is often substituted for tulip poplar in body parts. Elm and black gum are extensively used in hubs. Beech, cypress, basswood and yellow pine enter largely into the construction of wagon beds.

TABLE 13—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

VEHICLES AND VEHICLE PARTS.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Hickory	615,000	2,589,000	--------	3,204,000	74.5	$24.05	$77,070
2. Oak species	487,000	333,000	--------	820,000	19	30.45	24,972
3. Tulip poplar	4,000	102,000	--------	106,000	2.5	71.80	7,611
4. Ash species	19,000	39,000	--------	58,000	1.5	56.72	3,290
5. Red gum	--------	30,000	--------	30,000	.5	28.00	840
6. Black gum	15,000	10,000	--------	25,000	.5	10.00	250
7. American elm	--------	22,000	--------	22,000	.5	22.73	500
8. Beech	--------	15,000	--------	15,000	.5	24.00	360
9. Cypress	--------	12,000	--------	12,000	.3	70.00	840
10. Basswood	--------	8,000	--------	8,000	.2	30.00	240
11. S. yellow pines	--------	2,000	--------	2,000	--------	40.00	80
12. Sycamore	--------	1,000	--------	1,000	--------	120.00	120
13. Mahogany	--------	--------	1,000	1,000	--------	200.00	200
Totals	1,140,000	3,163,000	1,000	4,304,000	100	$27.04	$116,373

This industry, one of the oldest in Maryland, is one which in the past few years has been almost revolutionized. Concerns which have clung to the manufacture of carriages, wagons and only horse-drawn vehicles have in many cases seen their business melt slowly away. In this situation, they have had to turn to the making of auto parts and, unless their carriages happened to be an unusually well-known article with a famous trade-name, give up almost

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entirely the manufacture of their principal product, and the one for which the business was originally founded.

Carriage and motor vehicle repairs keep many old carriage and wagon manufactories in existence, but unless such firms are willing to modernize their plants and turn from the old article to something in growing and present demand, they must be content to look on and gradually to drop behind.

PICTURE FRAMES AND MOLDINGS.

The picture frame and molding industry embraces, in addition to picture frame material, moldings such as are used by paperhangers for drop ceilings, with those to cover electric wiring and framing for blackboards, and does not include those used in general house finishing. But six woods were reported as used by Maryland manufacturers; basswood constituting 73 per cent. It is used especially for the construction of frames and moldings that are to be painted or gilded. Its cheapness and good working qualities, and the fact that it holds paint well, particularly commend it. Oak, the next wood in point of use, went into picture frames and moldings where the natural finish was desired, its pleasing grain giving high ornamental value. All the wood used came from outside the State, although each of them is locally abundant.

TABLE 14—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

PICTURE FRAMES AND MOLDINGS.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Basswood	---------	1,700,000	--------	1,700,000	72.5	$27.30	$46,400
2. Oak species	---------	428,000	--------	428,000	18	47.43	20,300
3. Chestnut	---------	100,000	--------	100,000	4.5	45.00	4,500
4. Red gum	---------	100,000	--------	100,000	4.5	38.00	3,800
5. Birch species	---------	10,000	--------	10,000	.5	65.00	650
6. Wild black cherry	---------	5,000	--------	5,000	-------	65.00	325
Totals	---------	2,343,000	--------	2,343,000	100	$32.43	$75,975

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PLATE X. FIG. 1—RIMS AND HUBS.

The stock in this drying and storage room is fine-quality oak and hickory rims, with hubs of birch and elm.

PLATE X. FIG. 2—SPOKES AND HUBS.

When these hickory spokes and elm hubs have left the dry-room, they will be ready for assembling.

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MUSICAL INSTRUMENTS.

The production of musical instruments is an industry of magnitude in Baltimore; it is also foremost in Hagerstown. Sixteen different woods were reported by Maryland manufacturers, but only two of them were produced, in part, in Maryland, although nearly all are native trees. The average cost per thousand for the wood was $53.63, which is the second highest on the list. Ash, tulip poplar and hard maple comprise two-thirds of the wood used. Ash and maple are used largely for the framework of organs and pianos, spruce for sounding boards, white pine for keys and the finer grades of valuable hardwoods, such as mahogany, cherry and walnut, for cases. Chestnut, which is ordinarily used as a backing for veneer in pianos, was not reported by Maryland manufacturers.

TABLE 15—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

INSTRUMENTS, MUSICAL

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Ash species	---------	416,000	--------	416,000	27.5	$39.22	$16,315
2. Tulip poplar	---------	309,000	--------	309,000	20.5	54.66	16,890
3. Hard maple	---------	284,000	--------	284,000	19	43.73	12,420
4. Mahogany	---------	----------	101,000	101,000	6.5	141.09	14,250
5. E. white pine	---------	83,000	--------	83,000	5.5	71.25	5,914
6. Eastern spruce	---------	80,000	--------	80,000	5.5	36.25	2,900
7. Basswood	---------	75,000	--------	75,000	5	26.00	1,950
8. Birch species	---------	42,000	--------	42,000	3	48.00	2,016
9. Oak species	---------	39,000	--------	39,000	2.5	68.59	2,675
10. Beech	10,000	15,000	--------	25,000	1.5	36.00	900
11. W. white pine	---------	25,000	--------	25,000	1.5	70.00	1,750
12. Wild black cherry	---------	19,000	--------	19,000	1	82.63	1,570
13. Black walnut	1,000	5,000	--------	6,000	.5	115.00	690
14. Cypress	---------	4,000	--------	4,000	.5	65.00	260
15. Holly	---------	1,000	--------	1,000	--------	126.00	126
16. Cedar species	---------	1,000	--------	1,000	--------	350.00	350
Totals	11,000	1,398,000	101,000	1,510,000	100	$53.63	$80,976

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CIGAR BOXES.

Spanish cedar is the popular wood for cigar boxes because of the pleasing odor imparted to the contents, in addition to its good working qualities. Gum and tulip poplar were largely used for tobacco boxes and to some extent as a backing for Spanish cedar veneer. None of the wood used by this industry was Maryland-grown, although three of the four species reported are abundant in the State.

Maryland is an important tobacco-growing State, centers of leaf production being actually very close to the box factories of Baltimore. With both a local demand and an outside growing one, this industry should demonstrate steady expansion.

TABLE 16—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

BOXES, CIGAR.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Spanish cedar	---------	----------	332,000	332,000	45	$229.52	$76,200
2. Black gum	---------	295,000	--------	295,000	40	138.86	40,965
3. Red gum	---------	100,000	--------	100,000	13.5	51.00	5,100
4. Tulip poplar	---------	10,000	--------	10,000	1.5	192.50	1,925
Totals	---------	405,000	332,000	737,000	100	$168.51	$124,190

WOODENWARE AND NOVELTIES.

Under this class are a great variety of useful articles for household service, such as buckets, bowls, bread boards, rolling pins, rat and mouse traps, towel racks, meat boards, potato mashers, pails, etc., while there is an almost endless variety of novelties. Of the 13 woods used, red gum and basswood constitute 84 per cent. There was a larger percentage of home-grown woods used by this industry than any other—in all, 45 per cent. All of the red gum, oak, chestnut, yellow pine and black walnut were Maryland-grown.

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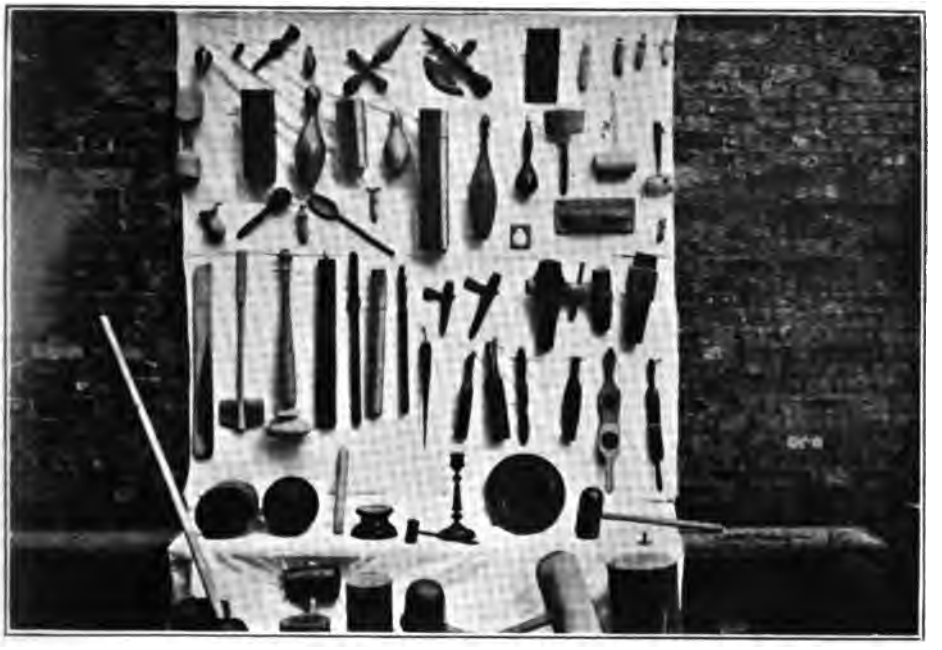

PLATE XI. FIG. 1—NOVELTIES.

There is literally nothing which the modern turnery cannot fashion from wood.

PLATE XI. FIG. 2—TOYS.

Made-in-America toys are used again. These dolls, save hair and eyes, are entirely a product of home-grown basswood.

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TABLE 17——SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

WOODENWARE AND NOVELTIES.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Red gum	240,000			240,000	43	$17.42	$4,180
2. Basswood		230,000		230,000	41	26.20	6,025
3. Tulip poplar		45,000		45,000	8	57.56	2,590
4. Lignum-vitae			18,000	18,000	3	166.67	3,000
5. Oak species	6,000			6,000	1	25.00	150
6. Wild black cherry		6,000		6,000	1	35.00	210
7. Chestnut	4,000			4,000	1	25.00	100
8. S. yellow pines	4,000			4,000	1	20.00	80
9. Mahogany			3,000	3,000	.5	150.00	450
10. Cypress		3,000		3,000	.5	25.00	75
11. Boxwood			1,000	1,000		120.00	120
12. Black walnut	1,000			1,000		40.00	40
13. Rosewood			1,000	1,000		300.00	300
Totals	255,000	284,000	23,000	562,000	100	$30.82	$17,320

TOYS.

Wooden toys and wooden parts of toys, partly of wood and partly of metal, consumed a very small part of the wood manufactured, although it represented a great variety of products. The

TABLE 18——SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

TOYS.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines		100,000		100,000	42.5	$13.00	$1,300
2. Tulip poplar		75,000		75,000	32	27.51	2,063
3. Basswood		55,000		55,000	23.5	22.00	1,210
4. Red gum		5,000		5,000	2	27.40	137
Totals		235,000		235,000	100	$20.04	$4,710

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Southern pines, tulip poplar and basswood were the principal varieties used, with a small amount of red gum.

The American toy is only now coming into its own. The once German monopoly is gone from our shops, and though the Japanese are busy capturing the market, toys made at home are enjoying a sharply rising demand.

PORTABLE HOUSES.

The manufacture of portable wooden houses is an industry of growing importance, which is here considered separately from ordinary house construction. Small houses and other portable buildings are made in standard sizes, shipped in parts and assembled at the place of use. They consist of garages, summer cottages and temporary quarters for workmen, tool houses, temporary school houses, churches, etc. White pine constitutes 70 per cent. of all wood used, while yellow pine comprises 24 per cent. A small amount of tulip poplar, cypress and red cedar was also used, although none of it was Maryland-grown.

The manufacture of such buildings shows healthy growth, and it is a business which should increase rather than diminish.

TABLE 19—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

PORTABLE HOUSES.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. E. white pines	---------	150,000	--------	150,000	70.5	$28.00	$4,200
2. S. yellow pines	---------	50,000	--------	50,000	23.5	12.50	625
3. Tulip poplar	---------	7,000	--------	7,000	3	34.86	244
4. Cypress	---------	5,000	--------	5,000	2.5	75.00	375
5. Cedar species	---------	1,000	--------	1,000	.5	29.00	29
Totals	---------	213,000	--------	213,000	100	$25.69	$5,473

TRUNKS, VALISES, LUGGAGE.

In all, but two woods were reported as used by this industry. Basswood constituted two-thirds and yellow pine the re-

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mainder. Basswood, while light in weight, is tough and strong, which, together with its good working qualities, make it a favorite wood for the purpose. Yellow pine is used for the cheaper grades of trunks, especially for trunk trays.

TABLE 20—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

TRUNKS, VALISES, LUGGAGE.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Basswood	---------	67,000	--------	67,000	67.5	$26.61	$1,783
2. S. yellow pines	---------	32,000	--------	32,000	32.5	16.00	512
Totals	---------	99,000	--------	99,000	100	$23.18	$2,295

MOLDS AND PATTERNS.

The manufacture of molds and patterns requires soft, even-grained woods that will keep their shape well under atmospheric changes. White pine answers these requirements, accounting for its exclusive use in these manufactures.

TABLE 21—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

MOLDS AND PATTERNS

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. E. white pine	---------	75,000	--------	75,000	100	$31.67	$2,375
Totals	---------	75,000	--------	75,000	100	$31.67	$2,375

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PART II

WOODS

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PART II

WOODS

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TABLE 22—SUMMARY OF WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

Kind of Wood.		Quantity Used.		Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
Common Name.	Botanical Name.	Board Feet.	Per Cent.		
1. Southern yellow pines	Pinus Echinata, Palustris, Taeda, Virginiana	242,376,000	70.2	$18.10	$4,387,022
2. Oak species	Quercus Alba, Prinus, Rubra, etc.	27,567,000	8	36.63	1,009,000
3. Cypress (bald)	Taxodium Distichum	10,439,000	3	36.54	381,470
4. Black gum	Nyssa Sylvatica	8,465,000	2.5	18.35	155,370
5. Tulip poplar	Liriodendron Tulipifera	8,145,000	2.4	41.91	341,396
6. Red gum	Liquidambar Styraciflua	7,462,000	2.2	19.32	144,147
7. Basswood	Tilia Americana	6,902,000	2	29.44	203,166
8. Eastern white pine	Pinus Strobus	4,748,000	1.4	47.75	226,727
9. Chestnut	Castanea Dentata	4,282,000	1.2	29.08	124,512
10. Beech	Fagus Americana	4,050,000	1.1	21.34	86,338
11. Hickory species	Hicoria Ovata, Alba, Glabra	3,211,000	.93	24.07	77,294
12. Douglas fir	Pseudotsuga Taxifolia	2,960,000	.86	32.96	97,575
13. Hard maple	Acer Saccharum	2,628,000	.76	30.47	80,068
14. Red maple	Acer Rubrum	2,349,000	.68	22.21	52,180
15. Birch species	Betula Lutea, Nigra, Papyrifera	1,275,000	.37	34.19	43,596
16. Black locust	Robinia Pseudacacia	1,075,000	.31	9.30	10,000
17. Yellow buckeye	Aesculus Octandra	1,000,000	.29	50.00	50,000
18. Mahogany	Swietenia Mahogoni	950,000	.28	138.52	131,597
19. Western white pine	Pinus Monticola	930,000	.27	37.88	35,225
20. Eastern spruce	Picea Mariana, Rubens, Canadensis	910,000	.26	28.11	25,580
21. Hemlock	Tsuga Canadensis	890,000	.26	20.11	17,900
22. Ash species	Fraxinus Americana, Nigra	676,000	.2	39.52	26,715
23. American elm	Ulmus Americana	385,000	.12	24.54	9,450
24. Spanish cedar	Cedra Odorata	332,000	.1	229.52	76,200
25. Black walnut	Juglans Nigra	187,000	.06	103.37	19,330
26. Cedar species	Juniperus Virginiana, Chamaecyparis Thyoides, Thuja Plicata	177,000	.05	44.94	7,955
27. Cotton gum	Nyssa Aquatica	175,000	.05	29.86	5,225
28. Circassian walnut	Juglans Regia	115,000	.03	228.26	26,250
29. Redwood	Sequoia Sempervirens	101,000	.03	45.59	4,605
30. Western spruce	Picea Sitchensis, Engelmanni	100,000	.03	35.00	3,500
31. Wild black cherry	Prunus Serotina	96,000	.03	*71.15	6,830
32. Sugar pine	Pinus Lambertiana	50,000	.01	45.00	2,250
33. Lignum-vitae	Guaiacum Officinale	30,000	.01	162.50	4,875
34. Rosewood	Dalbergia Species	26,000	.01	348.08	9,050
35. Cucumber	Magnolia Acuminata	15,000	---------	39.00	585
36. Teak	Tectona Grandis	9,000	---------	350.00	3,150
37. Tamarack	Larix Laricina	5,000	---------	50.00	250
38. Cottonwood	Populus Deltoidea	5,000	---------	30.00	150
39. Sycamore	Platanus Occidentalis	1,000	---------	120.00	120
40. Boxwood	Buxus Semperivirens	1,000	---------	120.00	120
41. Holly	Ilex Opaca	1,000	---------	126.00	126
Totals		345,101,000	100	$22.86	$7,887,770

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PLATE XII. FIG. 1 —FROM MILL AND FACTORY WASTE.

Waste has other uses than rubbish and fuel; witness, a few possibilities.

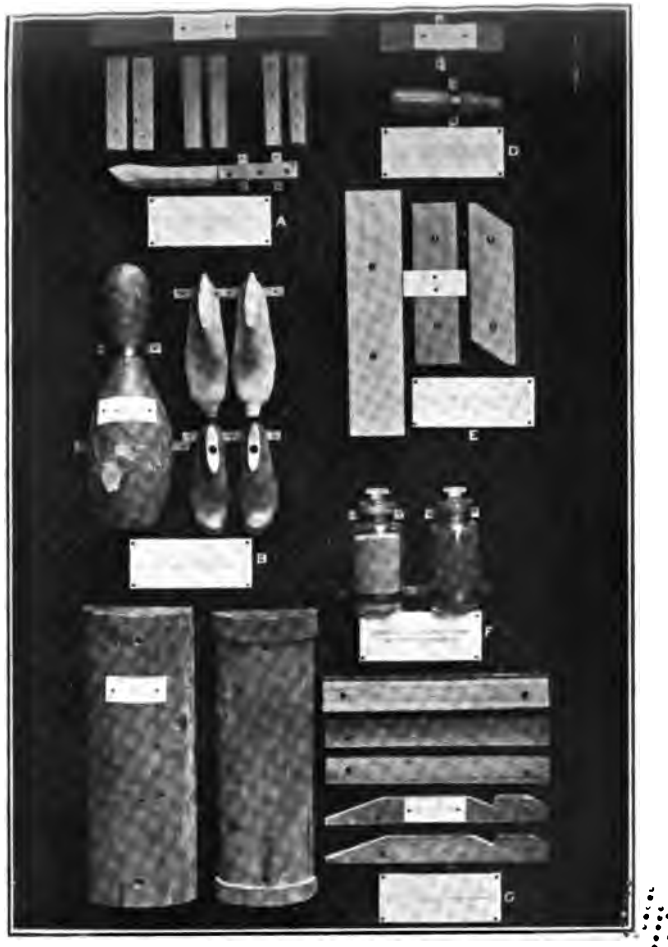

PLATE XII. FIG. 2—CLOSE UTILIZATION.

Sawdust will aid in cleaning floors, and small blocks of wood brush backs. It is all as the user sees it.

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KINDS OF WOOD

Southern Yellow Pines.

Southern yellow pines, including loblolly, short-leaf, long-leaf and scrub pine, represent 70 per cent. of the total amount of wood used by the Maryland manufacturers. Of the above species, all except the long-leaf pine grow in Maryland, although short-leaf pine but sparingly.

The pines are confined largely to Southern Maryland, where they are the principal timber species.

TABLE 23—CONSUMPTION OF SOUTHERN YELLOW PINES, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Boxes and crates, packing	33,898,000	120,932,000	--------	154,830,000	64	$14.80	$2,291,341
2. Planing mill products	4,667,000	53,940,000	--------	58,607,000	24.2	20.97	1,228,862
3. Tanks and silos	2,380,000	8,037,000	--------	10,417,000	4.5	29.07	302,817
4. Car construction	--------	9,890,000	--------	9,890,000	4	32.44	320,830
5. Ship and boat building	85,000	7,714,000	--------	7,799,000	3	28.57	222,835
6. Fixtures	--------	510,000	--------	510,000	.3	30.20	15,400
7. Baskets	100,000	--------	--------	100,000	-------	15.50	1,550
8. Toys	--------	100,000	--------	100,000	-------	13.00	1,300
9. Portable houses	--------	50,000	--------	50,000	-------	12.50	625
10. Furniture	--------	35,000	--------	35,000	-------	22.57	790
11. Trunks and valises	--------	32,000	--------	32,000	-------	16.00	512
12. Woodenware and novelties	4,000	--------	--------	4,000	-------	20.00	80
13. Vehicles and vehicle parts	--------	2,000	--------	2,000	-------	40.00	80
Totals	41,134,000	201,242,000	--------	242,376,000	100	$18.10	$4,387,022

The annual cut of yellow pine amounts to some 100,000,000 feet, about 41 per cent. of the amount used by manufacturers. Of the amount so used, but 17 per cent.—41,000,000 feet—was locally

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grown, the remainder of the Maryland cut going into rough lumber for construction purposes.

While there is some variation in the wood of the different species of the yellow pine, in general it is fairly even-grained, easily worked, abundant and obtainable in almost any desired sizes, making it extremely popular for a large variety of uses. The box, crate and packing industries used nearly two-thirds of the total quantity reported, while nearly one-fourth went into planing mill products. The average cost per thousand feet at the factory was the lowest paid for any manufactured lumber.

OAK SPECIES.

There are no less than 13 different species of oak used commercially in the State, often several species for the same purpose, so that it was impracticable to separate them. Furthermore, since

TABLE 24—CONSUMPTION OF OAK SPECIES, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Furniture	2,161,000	6,034,000	--------	8,195,000	30	$37.82	$309,901
2. Tanks and silos	1,933,000	3,634,000	--------	5,567,000	20	41.81	232,764
3. Planing mill products	592,000	3,506,000	--------	4,098,000	15	36.97	151,515
4. Ship and boat building	2,869,000	342,000	--------	3,211,000	12	33.45	107,414
5. Car construction	525,000	2,562,000	--------	3,087,000	11	24.08	74,190
6. Fixtures	540,000	911,000	--------	1,451,000	5	33.80	49,050
7. Vehicles and vehicle parts	487,000	333,000	--------	820,000	3	30.45	24,972
8. Caskets and coffins	--------	600,000	--------	600,000	2	60.00	36,000
9. Picture frames and moldings	--------	428,000	--------	428,000	2	47.43	20,300
10. Boxes and crates, packing	5,000	60,000	--------	65,000	--------	14.46	940
11. Instruments, musical	--------	39,000	--------	39,000	--------	68.59	2,675
12. Woodenware and novelties	6,000	--------	--------	6,000	--------	25.00	150
Totals	9,118,000	18,449,000	--------	27,567,000	100	$36.63	$1,009,871

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the trade recognizes only two classes—white oak and red oak—and their characteristics are not sufficiently well established by manufacturers to justify a distinction for this study, they are here grouped under the one title—oaks.

The oaks constitute 8 per cent. of the total amount of wood used by manufacturers, and 33 per cent. of that used was grown in Maryland. It is the most widely distributed of the important timber trees.

The most important species of oak, commercially, are white oak (Quercus Alba), red oak (Quercus Rubra), black oak (Quercus Velutina), chestnut oak (Quercus Prinus), scarlet oak (Quercus Coccinea), Spanish oak (Quercus Digitata) and pin oak (Quercus Palustris).

The wood of the oaks is hard, heavy, strong, tough and durable, serving many purposes.

CYPRESS (BALD).

This species reaches its northern limit of distribution as a forest tree in Southeastern Maryland, along the tidal rivers, where it occurs in pure stands or mixed with gum and other water-loving species. None of the Maryland-grown cypress was reported used by manufacturers, the State-grown material going into such products as shingles, poles and other local uses requiring unfinished material.

The principal uses reported by manufacturers are for planing mill products and packing boxes, as shown in Table 25. It is used generally for doors, sash, panels, molding and other interior finish. The wood is light, soft, straight-grained, easily worked and very durable. The latter quality makes it desirable for greenhouse construction, where conditions conducive to decay are prevalent.

BLACK GUM.

Black gum is distributed widely over the State, from the swamps of Southeastern Maryland to the mountains of Western Maryland, but though common, it is not regarded as especially important or valuable for timber. The wood, not hard, is tough and cross-grained, making it difficult to work. It is very largely cut into veneers and used for crates and baskets by the veneer mills of the lower Eastern Shore.

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TABLE 25—CONSUMPTION OF CYPRESS, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Planing mill products	---------	7,955,000	--------	7,955,000	76	$37.83	$300,965
2. Boxes and crates, packing	---------	1,025,000	--------	1,025,000	10	16.46	16,875
3. Car construction	---------	535,000	--------	535,000	5	46.82	25,050
4. Tanks and silos	---------	470,000	--------	470,000	4.5	45.32	21,300
5. Furniture	---------	300,000	--------	300,000	3	28.00	8,400
6. Ship and boat building	---------	85,000	--------	85,000	1	62.41	5,305
7. Fixtures	---------	45,000	--------	45,000	.5	45.00	2,025
8. Vehicles and vehicle parts	---------	12,000	--------	12,000	-------	70.00	840
9. Portable houses	---------	5,000	--------	5,000	-------	75.00	375
10. Instruments, musical	---------	4,000	--------	4,000	-------	65.00	260
11. Woodenware and novelties	---------	3,000	--------	3,000	-------	25.00	75
Totals	---------	10,439,000	--------	10,439,000	100	$36.54	$381,470

TABLE 26—CONSUMPTION OF BLACK GUM, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Boxes and crates, packing	70,000	7,400,000	--------	7,470,000	88	$13.30	$99,380
2. Baskets	160,000	250,000	--------	410,000	5	17.20	7,050
3. Boxes, cigar	---------	295,000	--------	295,000	3.5	138.86	40,965
4. Fixtures	---------	105,000	--------	105,000	2	35.00	3,675
5. Furniture	---------	90,000	--------	90,000	1	20.00	1,800
6. Planing mill products	30,000	30,000	--------	60,000	.5	35.00	2,100
7. Vehicles and vehicle parts	15,000	10,000	--------	25,000	-------	10.00	250
8. Tanks and silos	---------	10,000	--------	10,000	-------	15.00	150
Totals	275,000	8,190,000	--------	8,465,000	100	$18.35	$155,370

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TULIP POPLAR.

The use of this wood was reported by more manufacturers than any other. It is of fine texture, light, soft and easily worked, takes paint readily and holds its shape well, making it a favorite among wood users.

This species attains a larger size than any other tree in Maryland. It is found in the deep, moist soils of ravines and lower slopes throughout the central part of the State, but not in the mountain section.

A little over 8 per cent. of this species was Maryland-grown. Its chief uses were for furniture, boxes and crates, moldings, coffins and car construction. Out of the 19 wood-using industries, 14 reported the use of tulip poplar.

TABLE 27—CONSUMPTION OF TULIP POPLAR, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Furniture	300,000	1,727,000	--------	2,027,000	25	$48.09	$97,486
2. Boxes and crates, packing	--------	1,394,000	--------	1,394,000	17	16.37	22,816
3. Planing mill products	108,000	1,221,000	--------	1,329,000	16.5	37.36	49,654
4. Caskets and coffins	--------	1,000,000	--------	1,000,000	12	60.00	60,000
5. Car construction	--------	800,000	--------	800,000	10	60.00	48,000
6. Fixtures	--------	498,000	--------	498,000	6	41.58	20,705
7. Baskets	260,000	230,000	--------	490,000	6	17.09	8,375
8. Instruments, musical	--------	309,000	--------	309,000	4	54.66	16,890
9. Vehicles and vehicle parts	4,000	102,000	--------	106,000	1.5	71.80	7,611
10. Toys	--------	75,000	--------	75,000	1	27.51	2,063
11. Ship and boat building	--------	55,000	--------	55,000	.5	55.21	3,037
12. Woodenware and novelties	--------	45,000	--------	45,000	.5	57.56	2,590
13. Boxes, cigar	--------	10,000	--------	10,000	--------	192.50	1,925
14. Portable houses	--------	7,000	--------	7,000	--------	34.86	244
Totals	672,000	7,473,000	--------	8,145,000	100	$41.91	$341,376

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RED GUM.

This is the favorite wood, veneered, for making fruit and vegetable containers, this use taking nearly three-fourths of the entire amount used by manufacturers.

The tree grows throughout the Coastal Plain part of the State, along stream or river bottoms and in swamps. The wood is heavy, hard, fairly strong and tough, and of uniform texture. The marked difference between the sapwood and the heartwood—one white, the other red—has led many manufacturers to distinguish two species—the white sapwood being called white gum, while the dark red heart is called red gum.

Sixty-two per cent. of the amount used by manufacturers was Maryland-grown. The bulk of that imported came from North Carolina, South Carolina and Virginia.

TABLE 28—CONSUMPTION OF RED GUM, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Baskets	3,935,000	665,000	--------	4,600,000	62	$17.61	$80,995
2. Boxes and crates, packing	75,000	1,300,000	--------	1,375,000	18.5	15.37	21,130
3. Furniture	122,000	353,000	--------	475,000	6.5	29.33	13,933
4. Tanks and silos	133,000	132,000	--------	265,000	3.5	25.44	6,742
5. Woodenware and novelties	240,000	----------	--------	240,000	3	17.42	4,180
6. Planing mill products	90,000	77,000	--------	167,000	2	22.84	3,815
7. Boxes, cigar	---------	100,000	--------	100,000	1.4	51.00	5,100
8. Picture frames and moldings	---------	100,000	--------	100,000	1.4	38.00	3,800
9. Fixtures	---------	55,000	--------	55,000	.7	45.00	2,475
10. Ship and boat building	50,000	----------	--------	50,000	.6	20.00	1,000
11. Vehicles and vehicle parts	---------	30,000	--------	30,000	.4	28.00	840
12. Toys	---------	5,000	--------	5,000	-------	27.40	137
Totals	4,645,000	2,817,000	--------	7,462,000	100	$19.32	$144,147

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PLATE XIII. FIG. 1—EXPENSIVE WASTE.

Walnut slabs and edgings, remaining from manufacture of gun stocks, represent high cost and real value. Much may be re-worked.

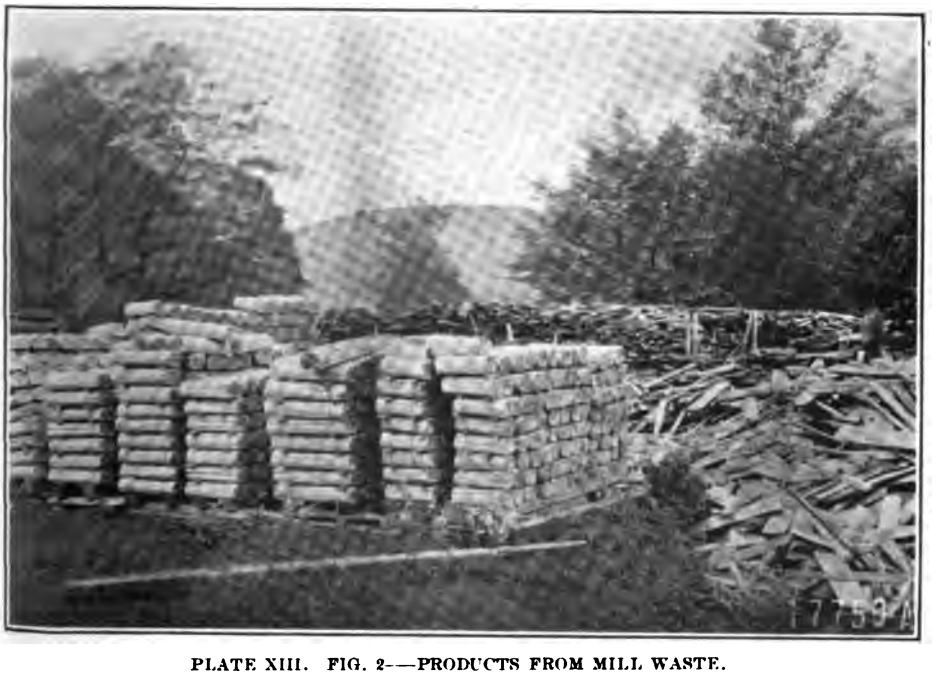

PLATE XIII. FIG. 2—PRODUCTS FROM MILL WASTE.

Mop handles, chair legs and dowels are cheaply made from beech, birch and maple waste such as appears in this picture. The finished product is ready for shipment.

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BASSWOOD.

Basswood is not abundant in the State, being confined chiefly to the mountain section of Western Maryland. A very small amount of that used by Maryland manufacturers was State-grown.

The wood is light, soft, easily worked, tough, but not strong. In its quality it closely resembles tulip poplar. It is sometimes called linden or linn, and is also known as white wood because of its light color.

It has a wide range of uses by Maryland manufacturers, no less than 12 of the 19 wood-using industries reporting its use in larger or smaller quantities.

TABLE 29—CONSUMPTION OF BASSWOOD, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Planing mill products	---------	2,100,000	--------	2,100,000	30	$32.30	$67,840
2. Picture frames and moldings	---------	1,700,000	--------	1,700,000	25	27.30	46,400
3. Boxes and crates, packing	---------	1,355,000	--------	1,355,000	20	19.83	26,875
4. Caskets and coffins	---------	700,000	--------	700,000	10	50.00	35,000
5. Furniture	---------	484,000	--------	484,000	7	24.89	12,047
6. Woodenware and novelties	---------	230,000	--------	230,000	3	26.20	6,025
7. Fixtures	---------	118,000	--------	118,000	2	30.64	3,626
8. Instruments, musical	---------	75,000	--------	75,000	1	26.00	1,950
9. Trunks and valises	---------	67,000	--------	67,000	1	26.61	1,783
10. Toys	---------	55,000	--------	55,000	1	22.00	1,210
11. Baskets	10,000	----------	--------	10,000	-------	17.00	170
12. Vehicles and vehicle parts	---------	8,000	--------	8,000	-------	30.00	240
Totals	10,000	6,892,000	--------	6,902,000	100	$29.44	$203,166

EASTERN WHITE PINE.

This species is found only in the western part of the State in sufficient quantity to rank as a timber tree, and even there it occurs in small, widely separated patches, although in the origi-

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nal forest it comprised a considerable portion of the merchantable timber in sections of Garrett and Allegany counties.

Of the amount used by Maryland manufacturers, less than 2 per cent. was Maryland-grown. It was required by 10 industries, but over half of it went into planing mill products.

The wood is light, soft, straight-grained and easily worked, though not strong. It is a tree well adapted to the mountain section of the State, where it is important for forest planting, and under forest management is likely to become much more widely distributed.

TABLE 30—CONSUMPTION OF WHITE PINE (EASTERN), YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Planing mill products	89,000	2,307,000	10,000	2,406,000	51	$60.98	$146,718
2. Boxes and crates, packing	--------	805,000	--------	805,000	17	26.07	20,983
3. Caskets and coffins	--------	750,000	--------	750,000	16	33.00	24,750
4. Tanks and silos	--------	300,000	--------	300,000	6	36.50	10,950
5. Portable houses	--------	150,000	--------	150,000	3	28.00	4,200
6. Car construction	--------	100,000	--------	100,000	2	50.00	5,000
7. Instruments, musical	--------	83,000	--------	83,000	2	71.25	5,914
8. Molds and patterns	--------	75,000	--------	75,000	2	31.67	2,375
9. Ship and boat building	--------	69,000	--------	69,000	1	75.17	5,187
10. Fixtures	--------	10,000	--------	10,000	--------	65.00	650
Totals	89,000	4,649,000	10,000	4,748,000	100	$47.75	$226,727

CHESTNUT.

This species is of common occurrence in all portions of the State, except the southeastern. In the central part of the State it is more abundant than any other species, if the oaks be separated by species. It is almost the universal wood for telephone and telegraph poles, and is used largely for railroad and trolley ties, fenc-

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ing and lumber for rough construction material. The wood is light, soft, liable to warp and check in seasoning, easily split, coarse and brittle, but durable under exposure.

The chestnut blight has in the past few years destroyed large quantities of chestnut. The disease is unabated and threatens to remove this species from the forest as a valuable timber tree.

The four important uses reported by manufacturers were planing mill products, furniture, caskets and fixtures. Only 17 per cent. of that used by Maryland manufacturers was State-grown.

TABLE 31—CONSUMPTION OF CHESTNUT, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Planing mill products	131,000	1,193,000	--------	1,324,000	31	$35.20	$46,611
2. Furniture	416,000	702,000	--------	1,112,000	26	20.62	22,927
3. Caskets and coffins	---------	750,000	--------	750,000	17.5	35.00	26,250
4. Fixtures	---------	725,000	--------	725,000	17	27.43	19,887
5. Boxes and crates, packing	180,000	75,000	--------	255,000	6	15.39	3,925
6. Picture frames and moldings	---------	100,000	--------	100,000	2.5	45.00	4,500
7. Car construction	---------	12,000	--------	12,000	--------	26.00	312
8. Woodenware and novelties	4,000	---------	--------	4,000	--------	25.00	100
Totals	725,000	3,557,000	--------	4,282,000	100	$29.08	$124,512

BEECH.

Beech is not abundant, but occurs throughout the Maryland forests. It is not cut to any great extent for lumber, and very little—less than 1 per cent.—was used by Maryland manufacturers. Of the amount used, 86 per cent. went into the manufacture of brushes, most of the remainder into furniture and basket-making. The wood is strong, hard, close-grained, not durable, difficult to season and to split.

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TABLE 32—CONSUMPTION OF BEECH, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Brushes	---------	3,500,000	--------	3,500,000	86.5	$20.50	$71,750
2. Furniture	---------	343,000	--------	343,000	8.5	22.13	7,589
3. Baskets	5,000	155,000	--------	160,000	4	21.78	5,515
4. Instruments, musical	10,000	15,000	--------	25,000	.5	36.00	900
5. Vehicles and vehicle parts	---------	15,000	--------	15,000	.5	24.00	360
6. Tanks and silos	---------	7,000	--------	7,000	-------	32.00	224
Totals	15,000	4,035,000	--------	4,050,000	100	$21.34	$86,338

HICKORY SPECIES.

Several species of hickory occur in the State, and all are used commercially. Only three, however, occur in quantity—the mockernut (Hickoria Alba), pignut (Hickoria Glabra) and shagbark (Hickoria Ovata). Practically the entire amount used by manufacturers was for vehicles and vehicle parts, with a small amount for tanks and silos. Of the amount used, 19 per cent. was Maryland-grown. This wood has a highly specialized use for vehicle manufacture, for which it is fitted by its distinctive qualities—hardness, strength, toughness and flexibility.

TABLE 33—CONSUMPTION OF HICKORY SPECIES, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Vehicles and vehicle parts	615,000	2,589,000	--------	3,204,000	99.8	$24.05	$77,070
2. Tanks and silos	---------	7,000	--------	7,000	.2	32.00	224
Totals	615,000	2,596,000	--------	3,211,000	100	$24.07	$77,294

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DOUGLAS FIR.

A western species, it finds general use in the East. It is a competitor of the long-leaf pine, available in any dimensions and having excellent qualities. More than 67 per cent. of the amount used was for tanks and silos. The balance was used largely for car construction and boat building.

TABLE 34—CONSUMPTION OF DOUGLAS FIR, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Tanks and silos	--------	2,000,000	--------	2,000,000	67.5	$31.50	$63,000
2. Car construction	--------	600,000	--------	600,000	20.5	35.67	21,400
3. Ship and boat building	--------	205,000	--------	205,000	7	27.56	5,650
4. Planing mill products	--------	155,000	--------	155,000	5	48.55	7,525
Totals	--------	2,960,000	--------	2,960,000	100	$32.96	$97,575

HARD MAPLE.

Where this species occurs in commercial quantities in the western counties of the State, it is known usually as sugar maple or sugar. The maple sugar industry, while restricted to three or four rather small areas in Garrett County, is nevertheless of considerable importance, since the annual output is worth over $40,000.

The hard maple reported by Maryland manufacturers was all grown outside of the State, although sawmill reports show that nearly an equal amount was produced in the State for the same period. Since the hard maple cut in Maryland was near the Pennsylvania and West Virginia borders, away from Maryland industrial centers, it went immediately out of the State.

Table 35 shows its use in nine industries. One-third of it was used in furniture-making, for which it is especially adapted. The wood is strong, hard and stiff, holding its shape well when properly seasoned.

The curly and bird's-eye maple, much in demand for furniture and special uses, is produced from trees of abnormal growth, though of this same species.

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TABLE 35—CONSUMPTION OF HARD MAPLE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Furniture	---------	974,000	--------	974,000	37	$25.00	$24,354
2. Brushes	---------	500,000	--------	500,000	19	23.50	11,750
3. Planing mill products	---------	432,000	--------	432,000	16	32.75	14,150
4. Baskets	---------	340,000	--------	340,000	13	36.40	12,375
5. Instruments, musical	---------	284,000	--------	284,000	12	43.73	12,420
6. Fixtures	---------	90,000	--------	90,000	3	50.00	4,500
7. Boxes and crates, packing	---------	5,000	--------	5,000	--------	80.00	400
8. Ship and boat building	---------	2,000	--------	2,000	--------	42.00	84
9. Car construction	---------	1,000	--------	1,000	--------	35.00	35
Totals	---------	2,628,000	--------	2,628,000	100	$30.47	$80,068

RED MAPLE.

Red maple grows abundantly in swamps and on lower slopes throughout the State, but is generally regarded as one of the least valuable species in the forest mixture. It is generally a small tree, and when it does attain large size is usually crooked and defective.

TABLE 36—CONSUMPTION OF RED MAPLE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Boxes and crates, packing	---------	1,500,000	--------	1,500,000	64	$18.00	$27,000
2. Furniture	---------	505,000	--------	505,000	21.5	29.90	15,100
3. Baskets	75,000	80,000	--------	155,000	6.5	26.77	4,150
4. Tanks and silos	134,000	---------	--------	134,000	5.5	29.89	4,005
5. Fixtures	---------	55,000	--------	55,000	2.5	35.00	1,925
Totals	209,000	2,140,000	--------	2,349,000	100	$22.21	$52,180

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PLATE XIV. FIG. 1—TYPICAL MILL WASTE.

This material, of good quality and fair size, is successfully converted into chair stock and mop handles. It is done in a plant which uses what others throw away.

PLATE XIV. FIG. 2—SAVED FROM THE SLAB PILE.

Slabs and edgings of beech, birch and maple have been profitably turned to a very good grade of chair parts.

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Its chief commercial use in Maryland is for tanks, silos and baskets. For the latter use it is cut into veneer, particularly in the Eastern Shore section of the State, together with red gum and sycamore.

The wood is rather soft, close-grained, light and not strong.

BIRCH SPECIES.

It is probable that several species of birch were used by Maryland manufacturers—Betula Lutea, yellow birch; B. Lenta, black birch; and B. Papyrifera, paper birch—although no distinctions were made in the reports. Black birch and yellow birch, both of which occur in Western Maryland, are most largely used by manufacturers, although no Maryland-grown timber of these species was reported.

The wood is heavy, strong and hard, dark brown in color. It is often used for the same purposes as mahogany, which it resembles. It was used by Maryland manufacturers principally for brush-backs, fixtures and furniture, although in addition to these uses it goes largely into flooring and interior finish.

TABLE 37—CONSUMPTION OF BIRCH SPECIES, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Brushes	---------	500,000	--------	500,000	40	$21.00	$10,500
2. Fixtures	---------	435,000	--------	435,000	34	46.90	20,400
3. Furniture	---------	180,000	--------	180,000	14	26.33	4,740
4. Planing mill products	---------	88,000	--------	88,000	7	51.14	4,540
5. Instruments, musical	---------	42,000	--------	42,000	3	48.00	2,016
6. Baskets	---------	20,000	--------	20,000	1.5	37.50	750
7. Picture frames and moldings	---------	10,000	--------	10,000	.5	65.00	650
Totals	---------	1,275,000	--------	1,275,000	100	$34.19	$43,596

BLACK LOCUST.

All the black locust used by Maryland manufacturers was reported as State-grown, and the only one of the 41 woods so re-

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ported that was supplied entirely from the forests of Maryland. It is the cheapest wood manufactured in this State. This is due in great part to securing it locally in the form of bolts in the rough.

The wood is heavy, hard, strong and very durable, holding its shape well, and having the necessary qualities for turning into insulator pins, treenails, etc.

In addition to its manufactured uses, it is especially valuable for fence posts, on account of its extreme durability. It is a farm and forest tree worth cultivating.

TABLE 38—CONSUMPTION OF BLACK LOCUST, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Fixtures	1,075,000	----------	--------	1,075,000	100	$9.30	$10,000
Totals	1,075,000	----------	--------	1,075,000	100	$9.30	$10,000

YELLOW BUCKEYE.

This species was reported by the casket and coffin makers, who used 1,000,000 feet in 1916—all imported, since it does not occur in Maryland in commercial quantities.

The wood is compact, close-grained, weak, light, soft, pale yellow in color, with scarcely any distinction between heart and sapwood.

TABLE 39—CONSUMPTION OF YELLOW BUCKEYE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Caskets and coffins	---------	1,000,000	--------	1,000,000	100	$50.00	$50,000
Totals	---------	1,000,000	--------	1,000,000	100	$50.00	$50,000

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Its chief use elsewhere is for woodenware, artificial limbs and paper pulp, in addition to that noted above.

MAHOGANY.

More mahogany was used by manufacturers than any other foreign wood, the bulk of it going into fixtures and furniture manufacture. The wood from different localities differs in tint and grain, but the general characteristics are a rich, reddish-brown color, even grain, moderately soft, giving high working qualities. It is also very durable. It was used by eight different classes of manufacturers.

TABLE 40—CONSUMPTION OF MAHOGANY, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Fixtures	---------	---------	377,000	377,000	39.6	$134.28	$50,625
2. Furniture	---------	---------	305,000	305,000	32.1	129.83	39,597
3. Planing mill products	---------	---------	108,000	108,000	11.4	140.97	15,225
4. Instruments, musical	---------	---------	101,000	101,000	10.6	141.09	14,250
5. Car construction	---------	---------	40,000	40,000	4.2	200.00	8,000
6. Ship and boat building	---------	---------	15,000	15,000	1.6	216.67	3,250
7. Woodenware and novelties	---------	---------	3,000	3,000	.4	150.00	450
8. Vehicles and vehicle parts	---------	---------	1,000	1,000	.1	200.00	200
Totals	---------	---------	950,000	950,000	100	$138.52	$131,597

WESTERN WHITE PINE.

This western species was apparently able to compete successfully with the eastern white pine for favor among the wood users. Less than one-fifth as much was used as of the eastern variety, but the average cost per thousand feet was considerably less than for the eastern species. Seventy-six per cent. of that used went into planing mill products, while boxes and crates took most of the remainder. The wood resembles the eastern species in all particulars.

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TABLE 41—CONSUMPTION OF WESTERN WHITE PINE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Planing mill products	---------	705,000	--------	705,000	76	$40.39	$28,475
2. Boxes and crates, packing	---------	200,000	--------	200,000	21.5	25.00	5,000
3. Instruments, musical	---------	25,000	--------	25,000	2.5	70.00	7,750
Totals	---------	930,000	--------	930,000	100	$37.88	$35,225

EASTERN SPRUCE.

There are two or three varieties of eastern spruce commonly used. It is probable, however, that most of that used by Maryland manufacturers was the red spruce of the Northeastern States and Canada. The boat builders and planing mills took more than 90 per cent. of the amount used, while the musical instrument makers consumed the remainder. The wood is light, soft, close-grained, of a pale reddish color. In addition to the uses named above, it is largely demanded for paper pulp and for construction material. The species does not grow in commercial quantities in Maryland.

TABLE 42—CONSUMPTION OF EASTERN SPRUCE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Ship and boat building	---------	435,000	--------	435,000	48	$21.84	$9,500
2. Planing mill products	---------	395,000	--------	395,000	43	33.37	13,186
3. Instruments, musical	---------	80,000	--------	80,000	9	36.25	2,900
Totals	---------	910,000	--------	910,000	100	$28.11	$25,586

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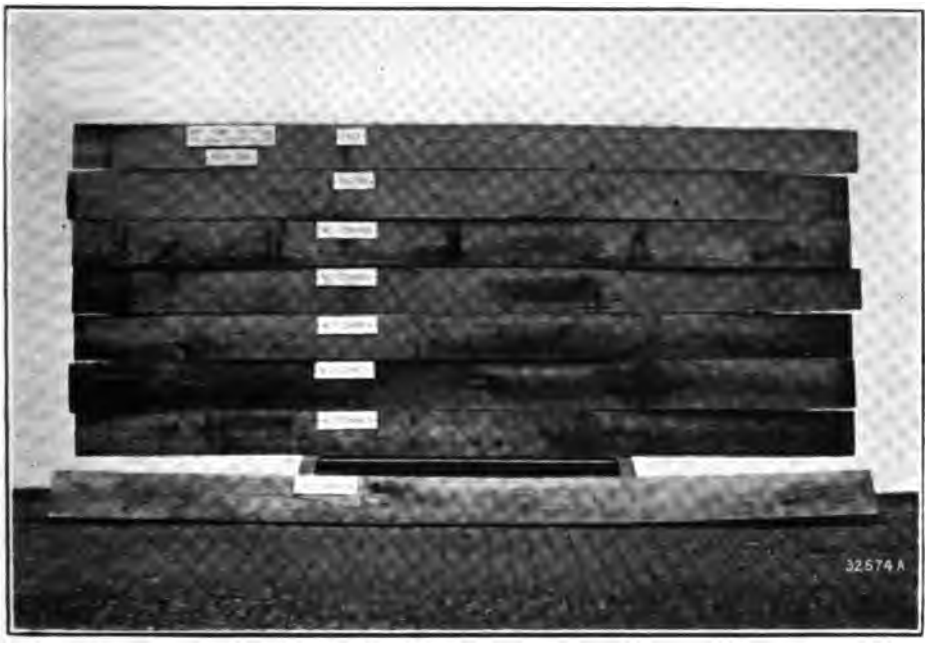

PLATE XV. FIG. 1—OAK BOARDS.

This material shows plainly the defects and good qualities which go to the making of a first-class board. All grades are used by Maryland manufacturers, who employ more oak than any other wood, excepting pine.

PLATE XV. FIG. 2—VEHICLE STOCK.

This trade requires great quantities of hickory, here shown seasoned, piled and ready for use. In consumption, it leads all other woods.

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HEMLOCK.

This wood was reported by two classes of users—planing mills and car builders. Less than 6 per cent. of that used was Maryland-grown, although the lumber cut of this species in the State for 1916 was nearly equal to the amount used by manufacturers. The wood is light, hard, brittle, cross-grained and difficult to work, but its cheapness and availability in large sizes commend it for many less exacting uses. Next to southern yellow pine it was the cheapest soft-wood lumber purchased by manufacturers.

TABLE 43—CONSUMPTION OF HEMLOCK, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Planing mill products	50,000	640,000	--------	690,000	77.5	$18.41	$12,700
2. Car construction	--------	200,000	--------	200,000	22.5	26.00	5,200
Totals	50,000	840,000	--------	890,000	100	$20.11	$17,900

ASH SPECIES.

The two species of ash most commonly used by manufacturers are the white ash (Fraxinus Americana) and the black ash (Fraxinus Nigra). It was not possible to separate the two kinds in use, although it is likely that white ash constituted at least 75 per cent. of the amount used. Both species occur in Maryland, the black ash sparingly, but only 4 per cent. of the wood used was home grown, although the amount of ash lumber cut in 1916 was 85 per cent. of the amount used by manufacturers. Strangely enough, 61 per cent. of the amount used by manufacturers was employed by the musical instrument makers in the frames of heavy instruments, while the car builders, furniture and vehicle manufacturing concerns, representing the more common uses of ash, took relatively small quantities. The wood of white ash is very heavy, strong, straight-grained, tough and elastic. In addition to the uses reported by Maryland manufacturers, it is also generally used in the manufacture of agricultural implements, tool handles, sporting goods, etc.

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TABLE 44—CONSUMPTION OF ASH SPECIES, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Instruments, musical	---------	416,000	--------	416,000	61	$39.29	$16,315
2. Car construction	---------	80,000	--------	80,000	12	50.00	4,000
3. Furniture	8,000	54,000	--------	62,000	9	21.94	1,360
4. Vehicles and vehicle parts	19,000	39,000	--------	58,000	9	56.72	3,290
5. Planing mill products	---------	40,000	--------	40,000	6	36.25	1,450
6. Tanks and silos	---------	20,000	--------	20,000	3	15.00	300
Totals	27,000	649,000	--------	676,000	100	$39.52	$26,715

AMERICAN ELM.

The basket manufacturers used 78 per cent. of the elm reported. It is the favorite wood for truck baskets and barrels. It is a common tree along the streams in Central and Southern Maryland, but nowhere abundant. Only 4 per cent. of the amount used by manufacturers was Maryland-grown. The wood is heavy, hard, strong, tough and difficult to work.

TABLE 45—CONSUMPTION OF AMERICAN ELM, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Baskets	25,000	275,000	--------	300,000	77.9	$24.17	$6,850
2. Tanks and silos	---------	63,000	--------	63,000	16.3	33.33	2,100
3. Vehicles and vehicle parts	---------	22,000	--------	22,000	5.8	22.73	500
Totals	25,000	360,000	--------	385,000	100	$24.54	$9,450

SPANISH CEDAR.

This wood, imported from the West Indies and Mexico, was used by the Maryland manufacturers exclusively for cigar boxes. Its aromatic odor, pleasing color, lightness, ease of working and

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holding its shape especially commend it for cigar-box making. It is one of the most expensive woods imported, and, next to mahogany, is brought in in larger quantities than any other foreign wood.

TABLE 46—CONSUMPTION OF SPANISH CEDAR, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Boxes, cigar	----------	----------	332,000	332,000	100	$229.52	$76,200
Totals	----------	----------	332,000	332,000	100	$229.52	$76,200

BLACK WALNUT.

A higher price was paid for black walnut than for any other hardwood purchased in the State by Maryland manufacturers, and of the amount used by them, 19 per cent. was State-grown, although an amount equalling about 75 per cent. of that used by manufacturers was cut into lumber in the State. Ninety per cent. of the amount used was for fixtures and planing mill products. The wood is a rich, dark brown color, hard, strong, easily worked, glues well and is not subject to warp or twist. In addition to the uses in-

TABLE 47—CONSUMPTION OF BLACK WALNUT, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Fixtures	1,000	117,000	--------	118,000	63	$117.71	$13,890
2. Planing mill products	25,000	25,000	--------	50,000	27	65.00	3,250
3. Furniture	7,000	5,000	--------	12,000	6.5	121.67	1,460
4. Instruments, musical	1,000	5,000	--------	6,000	3	115.00	690
5. Woodenware and novelties	1,000	----------	--------	1,000	.5	40.00	40
Totals	35,000	152,000	--------	187,000	100	$103.37	$19,330

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dicated in the subjoined table, it is also used largely for making gun stocks. The tree is widely distributed through the State, singly or in groups, but never in pure stands or in large quantities at any given place.

CEDAR SPECIES.

The principal cedars used are the southern white cedar (Chamaecyparis Thyoides) and the western cedar (Thuja Plicata) for ships, boats, packing boxes and portable houses, while it is quite certain that the small quantity used for musical instruments was the red cedar (Juniperus Virginiana). It is not possible from the data obtained to separate the species.

A small amount of the southern white cedar is cut in Maryland, although none of this was reported used by manufacturers. This species occurs in swamps along the Atlantic Coast from New Jersey southward. The wood is very durable, even, fine-grained, light, soft and easily worked. In addition to the uses reported by Maryland manufacturers, it is often used for tanks, silos and planing mill products. It is also a favorite wood for shingles, poles and posts because of its great durability.

TABLE 48—CONSUMPTION OF CEDAR SPECIES, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Ship and boat building	---------	148,000	--------	148,000	84	$43.89	$6,496
2. Boxes and crates, packing	---------	27,000	--------	27,000	15	40.00	1,080
3. Instruments, musical	---------	1,000	--------	1,000	.5	350.00	350
4. Portable houses	---------	1,000	--------	1,000	.5	29.00	29
Totals	---------	177,000	--------	177,000	100	$44.94	$7,955

COTTON GUM.

This is a southern species, growing in swamps and low lands. The wood is light, soft, weak, close-grained, difficult to split, not durable and very light brown or nearly white in color. All of

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that reported by Maryland manufacturers was used in boxes, crates and packing and was imported.

TABLE 49—CONSUMPTION OF COTTON GUM, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Boxes and crates, packing	---------	175,000	--------	175,000	100	$29.86	$5,225
Totals	---------	175,000	--------	175,000	100	$29.86	$5,225

CIRCASSIAN WALNUT.

A native of Persia and Northern China, this tree has been introduced into European countries. The highly figured wood of this tree, which gives it its chief value, comes from large burls or burrs which, when cut into veneers, produce the highly pleasing surface effects for which the wood is greatly prized.

TABLE 50—CONSUMPTION OF CIRCASSIAN WALNUT, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Furniture	---------	---------	65,000	65,000	56.5	$153.85	$10,000
2. Fixtures	---------	---------	50,000	50,000	43.5	325.00	16,250
Totals	---------	---------	115,000	115,000	100	$228.26	$26,250

REDWOOD.

The tree receives its name from the characteristic color of the wood. Practically all of the redwood lumber comes from California. The wood is of fine texture, very durable, easily worked, has a pleasing color and holds its shape well. Nearly all of that used went into tanks and silos. It is being extensively used in the East in competition with other woods and for a variety of uses, for which its good working qualities commend it.

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TABLE 51—CONSUMPTION OF REDWOOD, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Tanks and silos	---------	100,000	--------	100,000	99	$45.50	$4,550
2. Planing mill products	---------	1,000	--------	1,000	1	55.00	55
Totals	---------	101,000	--------	101,000	100	$45.59	$4,605

WESTERN SPRUCE.

The two species of western spruce most commonly found in eastern markets are Engelmann spruce (Picea Engelmanni) and Sitka spruce (Picea Sitchensis). The wood is light, soft, not strong, nearly white in color. The Sitka spruce is superior in that it has a straighter grain and better working qualities.

TABLE 52—CONSUMPTION OF WESTERN SPRUCE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Ships and boat building	---------	100,000	--------	100,000	100	$35.00	$3,500
Totals	---------	100,000	--------	100,000	100	$35.00	$3,500

BLACK CHERRY.

Of several species of cherry, the wild black cherry is the only one of commercial timber value. It is found in small quantities in the Maryland forests, particularly in the western part of the State, and 36 per cent. of that used was State-grown. It found a use among seven different industries, fixtures and musical instruments taking the larger share. The wood is moderately light, hard, strong, fine-grained, capable of a high polish and a favorite among cabinet makers.

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PLATE XVI. FIG. 1—THE VENEER SLICER.

Some veneers are cut with saws; others, from machines like this, are sliced with long, keen knives.

PLATE XVI. FIG. 2—TULIP POPLAR VENEER.

This sheet shows the possibilities of veneering and veneer-making. It measures 10 by 30 feet and is cut from the largest hardwood species growing in America.

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TABLE 53—CONSUMPTION OF BLACK CHERRY, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Fixtures	25,000	15,000	--------	40,000	41.5	$61.88	$2,475
2. Instruments, musical	--------	19,000	--------	19,000	20	82.63	1,570
3. Planing mill products	7,000	6,000	--------	13,000	13.5	25.00	1,975
4. Car construction	--------	10,000	--------	10,000	10.5	120.00	1,200
5. Woodenware and novelties	--------	6,000	--------	6,000	6.5	35.00	210
6. Picture frames and moldings	--------	5,000	--------	5,000	5	65.00	325
7. Furniture	3,000	--------	--------	3,000	3	25.00	75
Totals	35,000	61,000	--------	96,000	100	$71.15	$6,830

SUGAR PINE.

This species is confined almost exclusively to California, where it attains tremendous size and ranks high in commercial value. The wood, which is similar in character to the eastern white pine, is light, soft, straight-grained, readily seasoned and easily worked. The name is derived from a whitish, sugary substance which exudes from the tree when the wood is bruised, and also shows to some extent on the surface of freshly cut boards. All of that purchased by Maryland manufacturers went into planing mill products, for which it is particularly adapted.

TABLE 54—CONSUMPTION OF SUGAR PINE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Planing mill products	--------	50,000	--------	50,000	100	$45.00	$2,250
Totals	--------	50,000	--------	50,000	100	$45.00	$2,250

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LIGNUM-VITAE.

A foreign wood, extremely heavy and hard, close-grained, with fibers running obliquely both in radial and tangential directions, making it extremely difficult to split, these qualities give it a high value for bowling balls and other turned products. It is one of the most expensive woods used by manufacturers, and comes principally from Central America and the West Indies.

TABLE 55—CONSUMPTION OF LIGNUM-VITAE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Woodenware and novelties	---------	---------	18,000	18,000	60	$166.67	$3,000
2. Ship and boat building	---------	---------	12,000	12,000	40	156.25	1,875
Totals	---------	---------	30,000	30,000	100	$162.50	$4,875

ROSEWOOD.

A number of trees of different species from the tropical and semi-tropical countries come under the name rosewood. Most of that brought into this country comes from Central America and northern South America. The wood is characterized by a deep reddish color, often streaked with black, rose-scented when freshly cut, moderately heavy and hard, but easily worked, and taking a handsome polish. It is used in ornamental wood work. Next to teak, it was the most expensive wood purchased by manufacturers.

TABLE 56—CONSUMPTION OF ROSEWOOD, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Fixtures	---------	---------	25,000	25,000	96	$350.00	$8,750
2. Woodenware and novelties	---------	---------	1,000	1,000	4	300.00	300
Totals	---------	---------	26,000	26,000	100	$348.08	$9,050

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CUCUMBER.

The cucumber tree, so named from the fruit cone which resembles a cucumber, is the most important species of magnolia. It is closely related to the tulip poplar, and resembles it in appearance and character of wood, which is light, soft, close, straight-grained, durable and of a light yellowish color. It occurs in the mountains of Western Maryland, often attaining large size, although none of the State-grown wood was used by Maryland manufacturers.

TABLE 57—CONSUMPTION OF CUCUMBER, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Boxes and crates, packing	--------	15,000	--------	15,000	100	$39.00	$585
Totals	--------	15,000	--------	15,000	100	$39.00	$585

TEAK.

Teak is a tree native to Southern India, furnishing a wood that is very hard, heavy, strong and extremely durable. It was the most expensive wood used by Maryland manufacturers. All of that reported was consumed by the ship and boat building industries.

TABLE 58—CONSUMPTION OF TEAK, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Ship and boat building	--------	----------	9,000	9,000	100	$350.00	$3,150
Totals	--------	----------	9,000	9,000	100	$350.00	$3,150

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TAMARACK.

Tamarack has always been a favorite wood in the ship-building industry, which took all that reported by Maryland manufacturers. There is an eastern and a western species, the former being the one employed locally. It extends through New England, New York, Pennsylvania and in swamps along the Appalachian Mountains into Western Maryland, where it occurs in a few isolated patches, but not in commercial quantity. The wood is heavy, hard, strong, stiff and very durable.

TABLE 59—CONSUMPTION OF TAMARACK, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Ship and boat building	--------	5,000	--------	5,000	100	$50.00	$250
Totals	--------	5,000	--------	5,000	100	$50.00	$250

COTTONWOOD.

A small amount of cottonwood was used by Maryland manufacturers for crates and packing boxes. There are several species whose wood is marketed under the trade-name "Cottonwood," but it is likely that the species here used was the Populus Deltoidea, reaching its maximum development in the Mississippi Valley. The wood is soft, warps badly in seasoning, is difficult to split, but is tough and moderately strong, which, with the absence of odor, makes it a favorite for packing boxes, especially for food products.

TABLE 60—CONSUMPTION OF COTTONWOOD, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Boxes and crates, packing	--------	5,000	--------	5,000	100	$30.00	$150
Totals	--------	5,000	--------	5,000	100	$30.00	$150

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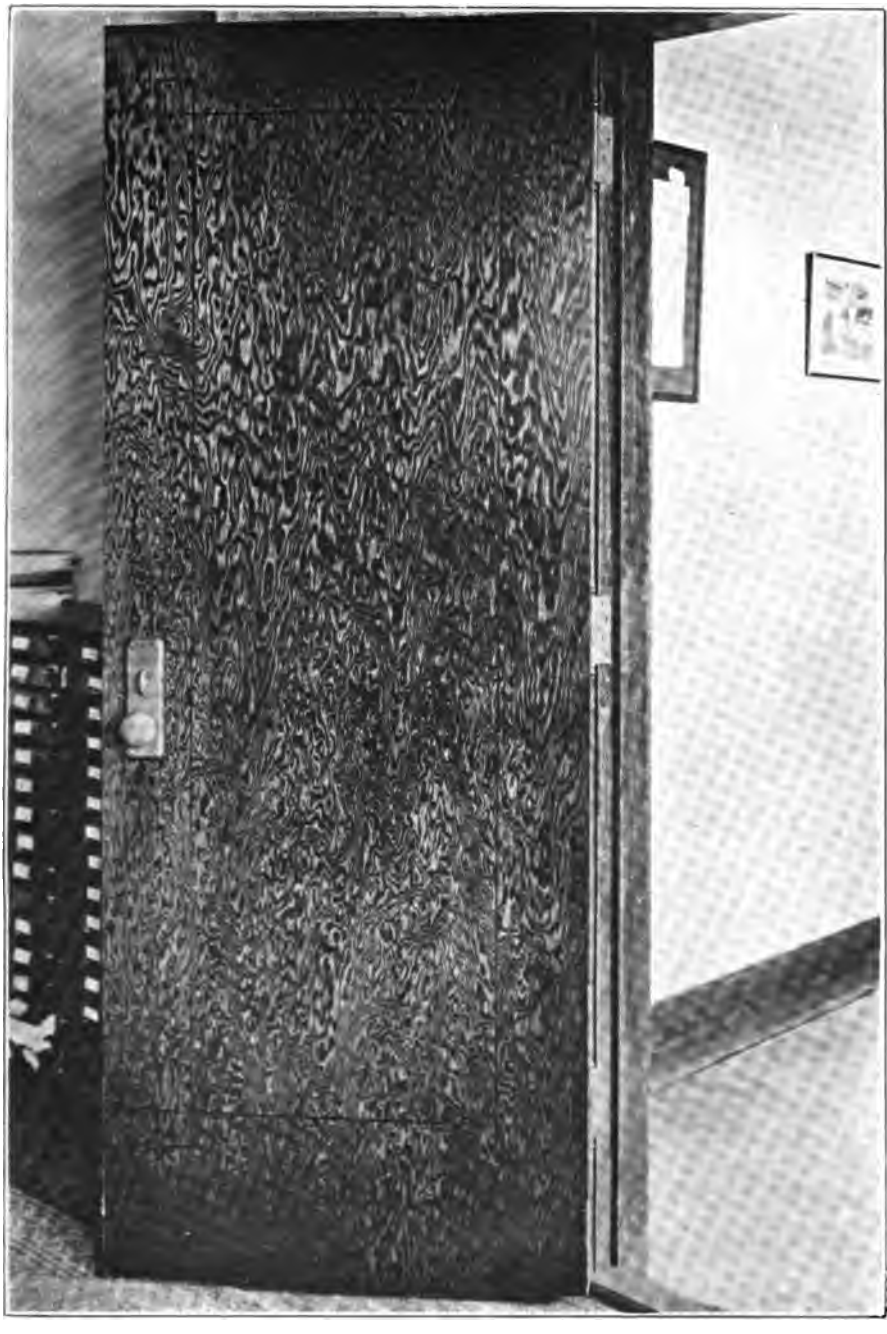

PLATE XVII. DOUGLAS FIR DOOR.

Douglas fir is one of the newer woods to the East; it has already earned a lasting reputation.

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SYCAMORE, BOXWOOD AND HOLLY.

Very small quantities of these woods were used by Maryland manufacturers.

In the case of sycamore, the amount used was no doubt much in excess of that reported, as it is cut and used extensively with the red gum and black gum for veneers, which go into basket-making. The amount reported was used in the form of veneer for panel work in vehicles and came from outside of the State.

TABLE 61—CONSUMPTION OF SYCAMORE, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Vehicles and vehicle parts	---------	1,000	--------	1,000	100	$120.00	$120
Totals	---------	1,000	--------	1,000	100	$120.00	$120

Boxwood was used to a limited extent for novelty work. The source of supply is Europe, Asia and the West Indies. The wood is heavy, hard, extremely fine, close-grained, well adapted for turnery, inlaying and wood engravings.

TABLE 62—CONSUMPTION OF BOXWOOD, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Woodenware and novelties	---------	----------	1,000	1,000	100	$120.00	$120
Totals	---------	----------	1,000	1,000	100	$120.00	$120

Holly is a native wood, seldom reaching tree size in Maryland. The small amount used by manufacturers was brought in

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from outside the State and used for action parts in pianos. The wood is heavy, hard, fine, close-grained like boxwood, and is frequently used for similar purposes.

TABLE 63—CONSUMPTION OF HOLLY, YEAR ENDING SEPTEMBER 1, 1916.

Industry.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Instruments, musical	---------	1,000	--------	1,000	100	$126.00	$126
Totals	---------	1,000	--------	1,000	100	$126.00	$126

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TABLE 64—SUMMARY OF STATE-GROWN AND SHIPPED-IN WOODS USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916.

Kind of Wood.	Maryland.	Per Cent.	United States.	Per Cent.	Foreign.	Per Cent.	Total Bd. Ft.
1. Ash species	27,000	4	649,000	96	-------	-------	676,000
2. Basswood	10,000	.1	6,892,000	99.1	-------	-------	6,902,000
3. Beech	15,000	.4	4,035,000	99.6	-------	-------	4,050,000
4. Birch species	-------	-------	1,275,000	100	-------	-------	1,275,000
5. Boxwood	-------	-------	-------	-------	1,000	100	1,000
6. Buckeye, yellow	-------	-------	1,000,000	100	-------	-------	1,000,000
7. Cedar species	-------	-------	177,000	100	-------	-------	177,000
8. Cedar, Spanish	-------	-------	-------	-------	332,000	100	332,000
9. Cherry, wild black	35,000	36	61,000	64	-------	-------	96,000
10. Chestnut	725,000	17	3,557,000	83	-------	-------	4,282,000
11. Cottonwood	-------	-------	5,000	100	-------	-------	5,000
12. Cucumber	-------	-------	15,000	100	-------	-------	15,000
13. Cypress	-------	-------	10,439,000	100	-------	-------	10,439,000
14. Elm, American	25,000	6	360,000	94	-------	-------	385,000
15. Fir, Douglas	-------	-------	2,960,000	100	-------	-------	2,960,000
16. Gum, black	275,000	3	8,190,000	97	-------	-------	8,465,000
17. Gum, cotton	-------	-------	175,000	100	-------	-------	175,000
18. Gum, red	4,645,000	62	2,817,000	38	-------	-------	7,462,000
19. Hemlock	50,000	6	840,000	94	-------	-------	890,000
20. Hickory species	615,000	19	2,596,000	81	-------	-------	3,211,000
21. Holly	-------	-------	1,000	100	-------	-------	1,000
22. Lignum-vitae	-------	-------	-------	-------	30,000	100	30,000
23. Locust, black	1,075,000	100	-------	-------	-------	-------	1,075,000
24. Mahogany	-------	-------	-------	-------	950,000	100	950,000
25. Maple, hard	-------	-------	2,628,000	100	-------	-------	2,628,000
26. Maple, red	209,000	9	2,140,000	91	-------	-------	2,349,000
27. Oak species	9,118,000	33	18,449,000	67	-------	-------	27,567,000
28. Pine, Eastern white	89,000	1.8	4,649,000	98	10,000	.2	4,748,000
29. Pines, Southern yellow	41,134,000	17	201,242,000	83	-------	-------	242,376,000
30. Pine, sugar	-------	-------	50,000	100	-------	-------	50,000
31. Pine, Western white	-------	-------	980,000	100	-------	-------	980,000
32. Poplar, tulip	672,000	8	7,473,000	92	-------	-------	8,145,000
33. Redwood	-------	-------	101,000	100	-------	-------	101,000
34. Rosewood	-------	-------	-------	-------	26,000	100	26,000
35. Spruce, Eastern	-------	-------	910,000	100	-------	-------	910,000
36. Spruce, Western	-------	-------	100,000	100	-------	-------	100,000
37. Sycamore	-------	-------	1,000	100	-------	-------	1,000
38. Tamarack	-------	-------	5,000	100	-------	-------	5,000
39. Teak	-------	-------	-------	-------	9,000	100	9,000
40. Walnut, black	35,000	19	152,000	81	-------	-------	187,000
41. Walnut, Circassian	-------	-------	-------	-------	115,000	100	115,000
Totals	58,754,000	17	284,874,000	82.6	1,473,000	.4	345,101,000

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USES OF THE DIFFERENT WOODS IN ORDER OF IMPORTANCE.

(Check list for rapid reference.)

ASH SPECIES.

Instruments, musical.
Car construction.
Furniture.
Vehicles and vehicle parts
Planing mill products.
Tanks and silos, cooperage

BASSWOOD.

Planing mill products.
Picture frames and moldings
Boxes and crates.
Caskets and coffins.
Furniture.
Woodenware and novelties.
Fixtures.
Instruments, musical.
Trunks, valises, luggage.
Toys.
Baskets.
Vehicles and vehicle parts.

BEECH.

Brushes.
Furniture.
Baskets.
Instruments, musical.
Vehicles and vehicle parts.
Tanks and silos, cooperage.

BIRCH SPECIES.

Brushes.
Fixtures.
Furniture.
Planing mill products.
Instruments, musical.
Baskets.
Picture frames and moldings.

BOXWOOD.

Woodenware and novelties.

BUCKEYE, YELLOW.

Caskets and coffins.

CEDAR SPECIES.

Ship and boat building.
Boxes and crates.
Instruments, musical.
Portable houses.

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CEDAR, SPANISH.

Boxes, cigar.

CHERRY, WILD BLACK.

Fixtures.
Instruments, musical.
Planing mill products.
Car construction.
Woodenware and novelties.
Picture frames and moldings.
Furniture.

CHESTNUT.

Planing mill products.
Furniture.
Caskets and coffins.
Fixtures.
Boxes and crates.
Picture frames and moldings.
Car construction.
Woodenware and novelties.

COTTONWOOD.

Boxes and crates.

CUCUMBER.

Boxes and crates.

CYPRESS.

Planing mill products.
Boxes and crates.
Car construction.
Tanks and silos, cooperage.
Furniture.
Ship and boat building.
Fixtures.
Vehicles and vehicle parts.
Portable houses.
Instruments, musical.
Woodenware and novelties.

ELM, AMERICAN.

Baskets.
Tanks and silos, cooperage.
Vehicles and vehicle parts.

FIR, DOUGLAS.

Tanks and silos, cooperage.
Car construction.
Ship and boat building.
Planing mill products.

GUM, BLACK.

Boxes and crates.
Baskets.
Boxes, cigar.
Fixtures.
Furniture.
Planing mill products.
Vehicles and vehicle parts.
Tanks and silos, cooperage.

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GUM, COTTON.

Boxes and crates.

GUM, RED.

Baskets.
Boxes and crates.
Furniture.
Tanks and silos, cooperage.
Woodenware and novelties.
Planing mill products.
Boxes, cigar.
Picture frames and moldings.
Fixtures.
Ship and boat building.
Vehicles and vehicle parts.
Toys.

HEMLOCK.

Planing mill products.
Car construction.

HICKORY SPECIES.

Vehicles and vehicle parts.
Tanks and silos, cooperage.

HOLLY.

Instruments, musical.

LIGNUM-VITAE.

Woodenware and novelties.
Ship and boat building.

LOCUST, BLACK.

Fixtures.

MAHOGANY.

Fixtures.
Furniture.
Planing mill products.
Instruments, musical.
Car construction.
Ship and boat building.
Woodenware and novelties.
Vehicles and vehicle parts.

MAPLE, HARD.

Furniture.
Brushes.
Planing mill products.
Baskets.
Instruments, musical.
Fixtures.
Boxes and crates.
Ship and boat building.
Car construction.

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PLATE XVIII. TAMARACK KNEES.

It is doubtful if tamarack (or hackmatack) knees are worth much except in making just one thing—ships. They grow like this, their natural function being to lift trees out of the water in which tamarack generally grows.

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MAPLE, RED.

Boxes and crates.
Furniture.
Baskets.
Tanks and silos, cooperage.
Fixtures.

OAK SPECIES.

Furniture.
Tanks and silos, cooperage.
Planing mill products.
Ship and boat building.
Car construction.
Fixtures.
Vehicles and vehicle parts.
Caskets and coffins.
Picture frames and moldings.
Boxes and crates.
Instruments, musical.
Woodenware and novelties.

PINE, EASTERN WHITE.

Planing mill products.
Boxes and crates.
Caskets and coffins.
Tanks and silos, cooperage.
Portable houses.
Car construction.
Instruments, musical.
Molds and patterns.
Ship and boat building.
Fixtures.

PINES, SOUTHERN YELLOW.

Boxes and crates.
Planing mill products.
Tanks and silos, cooperage.
Car construction.
Ship and boat building.
Fixtures.
Baskets.
Toys.
Portable houses.
Furniture.
Trunks and valises.
Woodenware and novelties.
Vehicles and vehicle parts.

PINE, SUGAR.

Planing mill products.

PINE, WESTERN WHITE.

Planing mill products.
Boxes and crates.
Instruments, musical.

POPLAR, TULIP.

Furniture.
Boxes and crates.
Planing mill products.
Caskets and coffins.
Car construction.
Fixtures.
Baskets.
Instruments, musical.
Vehicles and vehicle parts.
Toys.
Ship and boat building.
Woodenware and novelties.
Boxes, cigar.
Portable houses.

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REDWOOD.

Tanks and silos, cooperage.
Planing mill products.

ROSEWOOD.

Fixtures.
Woodenware and novelties.

SPRUCE, EASTERN.

Ship and boat building.
Instruments, musical.
Planing mill products.

SPRUCE, WESTERN.

Ship and boat building.

SYCAMORE.

Vehicles and vehicle parts.

TAMARACK.

Ship and boat building.

TEAK.

Ship and boat building.

WALNUT, BLACK.

Fixtures.
Instruments, musical.
Planing mill products.
Woodenware and novelties.
Furniture.

WALNUT, CIRCASSIAN.

Furniture.
Fixtures.

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TABLE 65—DISTRIBUTION OF MARYLAND WOOD USED BY MANUFACTURERS.

Kind of Wood.	Commercial Range.*	Lumber Cut in 1916 (Estimated).	Amount Employed by Wood-Using Industries.	
			Total, All Sources.	Maryland-Grown.
Softwoods.				
1. Yellow pine	S	43,175,000	242,376,000	41,134,000
2. White pine	W	1,861,000	4,748,000	89,000
3. Hemlock	W	820,000	890,000	50,000
4. Cypress	S	217,000	10,439,000	----------
5. White cedar	S	38,000	177,000	----------
6. Red cedar	S, C	15,000	1,000	----------
Hardwoods.				
7. Oak species	C, W, S	24,687,000	27,567,000	9,118,000
8. Chestnut	C, W, S	12,963,000	4,282,000	725,000
9. Red gum	S	2,865,000	7,462,000	4,645,000
10. Hard maple	W	2,116,000	2,628,000	----------
11. Tulip poplar	C, S, W	1,613,000	3,145,000	672,000
12. Red maple	S, C, W	1,278,000	2,349,000	209,000
13. Hickory species	C, W, S	1,275,000	3,211,000	615,000
14. Basswood	W	896,000	6,902,000	10,000
15. Ash species	C, W, S	519,000	676,000	27,000
16. Birch species	W	497,000	1,275,000	----------
17. Sycamore	S, C	482,000	1,000	----------
18. Beech	W, C	468,000	4,050,000	15,000
19. Black gum	S, C, W	173,000	3,465,000	275,000
20. Black walnut	C, S	135,000	187,000	35,000
21. Elm	S, C, W	105,000	385,000	25,000
22. Cucumber	W	85,000	15,000	----------
23. Black locust	C, S, W	80,000	1,075,000	1,075,000
24. Wild black cherry	W, C	50,000	96,000	35,000
25. Holly	S	----------	1,000	----------
Totals	----------	96,413,000	337,408,000	56,754,000

* C, Central; S, Southern; W, Western Maryland. Letters appear in order of regional occurrence and importance.

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PART III

THE COUNTIES

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TABLE 66—SUMMARY OF WOOD USED IN MARYLAND, YEAR ENDING SEPTEMBER 1, 1916—BY COUNTIES.*

County.	Grown in Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Baltimore City and County	7,555,000	213,419,000	1,450,000	222,424,000	64	$23.72	$5,328,073
2. Wicomico	15,373,000	15,195,000	--------	30,568,000	9	18.45	563,900
3. Washington	3,303,000	14,208,000	20,000	17,531,000	6	25.25	442,689
4. Worcester	11,300,000	2,605,000	--------	13,905,000	4	18.18	269,725
5. Anne Arundel	550,000	12,090,000	--------	12,640,000	4	20.51	259,274
6. Dorchester	8,320,000	4,155,000	--------	12,475,000	4	16.50	205,800
7. Frederick	20,000	10,035,000	3,000	10,058,000	3	27.94	281,068
8. Somerset	6,690,000	2,410,000	--------	9,100,000	3	15.99	145,390
9. Caroline	2,920,000	1,680,000	--------	4,600,000	1	15.80	72,678
10. Cecil	550,000	2,050,000	--------	2,600,000	.7	34.50	89,700
11. Talbot	645,000	1,758,000	--------	2,403,000	.7	25.59	60,871
12. Garrett	32,000	2,128,000	--------	2,160,000	.6	27.67	59,775
13. Kent	756,000	850,000	--------	1,606,000	--------	20.09	32,160
14. Allegany	259,000	974,000	--------	1,233,000	--------	26.00	32,056
15. Calvert	260,000	950,000	--------	1,210,000	--------	36.74	44,450
16. Carroll	21,000	347,000	--------	368,000	--------	39.62	14,581
17. Montgomery	200,000	20,000	--------	220,000	--------	34.48	7,585
Totals	58,754,000	284,874,000	1,473,000	345,101,000	100	$22.86	$7,887,770

* Since this data was secured, certain county and city boundaries have been changed.

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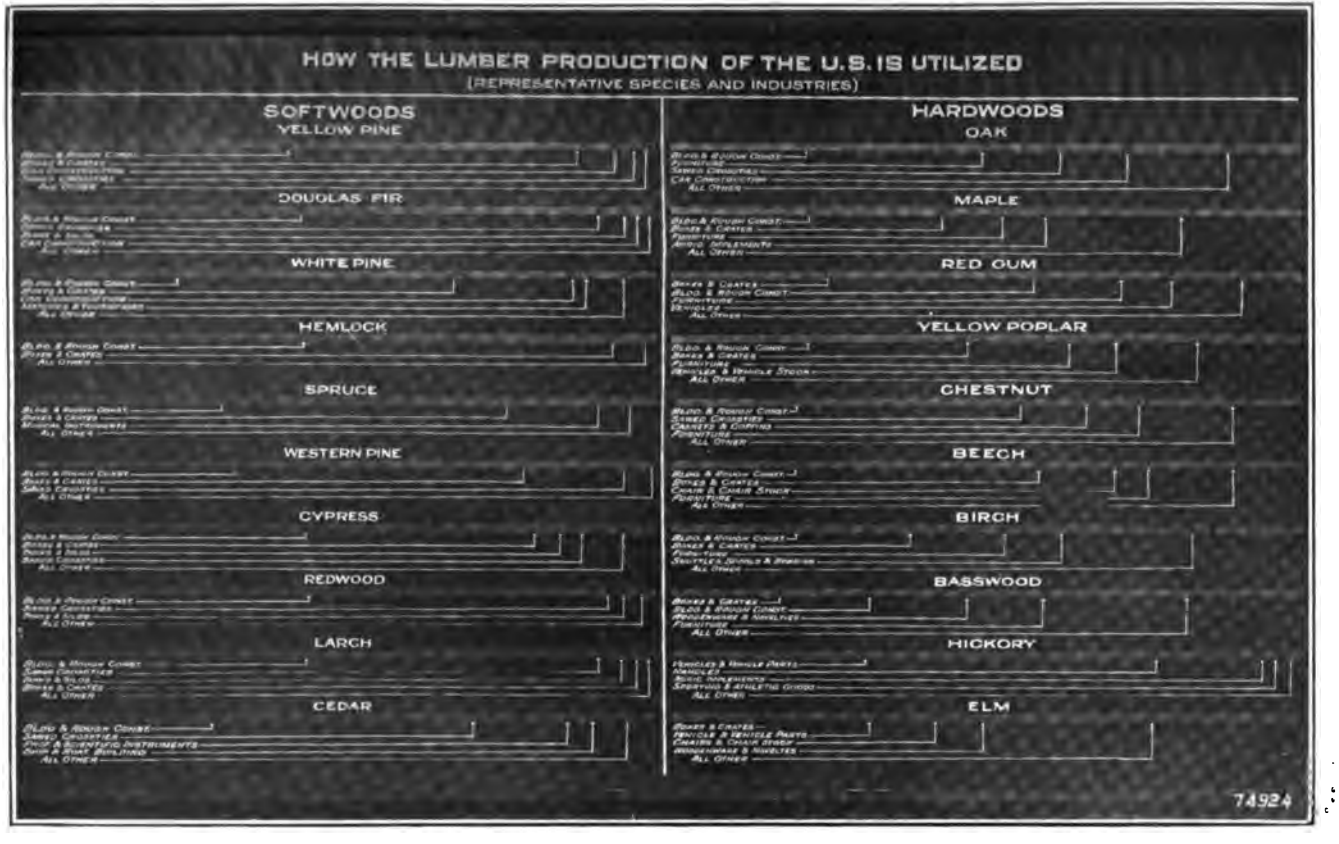

PLATE XIX. U. S. USES FOR WOOD.

The division, by hardwoods and softwoods, species and industries, points where American woods go.

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WOODS USED IN MARYLAND, BY COUNTIES

Following are tables and descriptions which show clearly and with all necessary detail the kinds of wood manufactured in each county of the State, with the amounts grown in Maryland, the United States and foreign countries, the total quantities used and what they cost. Six counties have been omitted, as forest industries are not active in them. These counties are Charles, Harford, Howard, Prince George's, Queen Anne's and St. Mary's. These counties are all timber producers, but for various reasons their manufacturing is done outside. It is significant that Carroll County, which pays more per thousand for its material than any other county in the State, grows but 6 per cent. or less itself, whereas Caroline County, with the cheapest wood, uses 63 per cent. of local and Maryland-grown timber. Somerset, which is next, utilizes 74 per cent. of Maryland woods and produces them largely from her own forests. In number of employees, Baltimore City and County lead, with Washington next, then Wicomico and last Montgomery. In number of plants, Baltimore, of course, leads again, followed by Wicomico and Worcester; Cecil, Calvert and Garrett having the fewest. It is significant that the counties of the lower Eastern Shore employ to a large extent both men and women. The counties will appear in order of importance.

Baltimore City and County.

Baltimore City and County naturally lead the State in forest industries, as in all other kinds. Twenty-four per cent. of the county is wooded and this and neighboring counties produce more than 7,000,000 feet of the timber which it manufactures. It is, of course, the heaviest importer in the State of high-priced foreign woods. All together, there are 38 varieties of wood used by this trade in Baltimore. Manufactories of wood employ nearly 8,000

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people in 164 plants. These plants are of prime importance to the industrial activity of the city and the State. With unparalleled shipping facilities by rail and water, there is no reason why Baltimore should not continue a leader in the manufacture of forest products along the Atlantic Coast.

TABLE 67—MEN AND PLANTS ENGAGED IN WOOD-USING INDUSTRIES OF MARYLAND, BY COUNTIES, EXCLUDING BALTIMORE.

County.	No. Plants.	No. Men.	Average Men Per Plant.
1. Washington	15	960	64
2. Wicomico	21	491*	23
3. Frederick	5	420	84
4. Worcester	17	294†	17
5. Anne Arundel	6	288	48
6. Somerset	9	144	16
7. Dorchester	9	143	16
8. Talbot	5	122	24
9. Kent	3	89	30
10. Allegany	8	86	11
11. Cecil	2	75	37
12. Caroline	7	58	8
13. Calvert	2	27	13
14. Garrett	2	25	12
15. Carroll	4	14	3
16. Montgomery	3	10	3
The Counties	118	3,252	.....

* One-tenth women and children.
† One-half women and children.

WICOMICO COUNTY.

Wicomico County, although of course far behind Baltimore, leads the rest of the State in manufacturing of wooden products. Forty-six per cent. of the county is wooded and more than half of what it manufactures is locally produced. It is well located for growing, manufacturing and shipping, and in certain industries stands foremost in Maryland. The manufacturing of boxes and baskets leads, with a certain number of establishments manufac-

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TABLE 68—BALTIMORE CITY (AND COUNTY).

Kind of Wood.	Maryland Grown	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	1,804,000	156,281,000	--------	158,085,000	70	$17.85	$2,821,126
2. Oak species	4,632,000	10,759,000	--------	15,391,000	7	40.99	630,806
3. Cypress	--------	7,962,000	--------	7,962,000	4	35.82	285,182
4. Black gum	95,000	6,940,000	--------	7,035,000	3	19.12	134,510
5. Basswood	--------	6,183,000	--------	6,183,000	3	29.88	184,774
6. Tulip poplar	300,000	5,834,000	--------	6,134,000	3	47.39	290,679
7. E. white pine	--------	4,114,000	--------	4,114,000	2	49.16	202,229
8. Chestnut	539,000	2,627,000	--------	3,166,000	1.5	29.46	93,264
9. Red maple	--------	2,140,000	--------	2,140,000	1	21.88	46,825
10. Red gum	--------	2,137,000	--------	2,137,000	1	22.62	48,345
11. Hard maple	--------	1,282,000	--------	1,282,000	.6	35.19	45,119
12. Beech	--------	1,230,000	--------	1,230,000	.5	20.32	25,000
13. Yellow buckeye	--------	1,000,000	--------	1,000,000	.4	50.00	50,000
14. Mahogany	--------	--------	937,000	937,000	.4	138.26	129,547
15. Douglas fir	--------	860,000	--------	860,000	.4	34.97	30,075
16. W. white pine	--------	820,000	--------	820,000	.4	34.48	28,275
17. Hickory species	104,000	582,000	--------	686,000	.3	60.12	41,240
18. Ash species	11,000	648,000	--------	659,000	.3	39.61	26,095
19. Birch species	--------	609,000	--------	609,000	.3	47.02	28,636
20. Eastern spruce	--------	485,000	--------	485,000	.2	24.48	11,875
21. Spanish cedar	--------	--------	332,000	332,000	.1	229.52	76,200
22. Hemlock	--------	200,000	--------	200,000	.1	26.00	5,200
23. Black walnut	35,000	152,000	--------	187,000	.1	103.37	19,330
24. Cotton gum	--------	175,000	--------	175,000	.1	29.86	5,225
25. American elm	--------	163,000	--------	163,000	.1	34.66	5,650
26. Circassian walnut	--------	--------	115,000	115,000	.1	228.26	26,250
27. Western spruce	--------	100,000	--------	100,000	.05	35.00	3,500
28. Cherry	35,000	61,000	--------	96,000	.05	71.15	6,830
29. Cedar species	--------	52,000	--------	52,000	--------	56.83	2,955
30. Lignum-vitae	--------	--------	30,000	30,000	--------	162.50	4,875
31. Rosewood	--------	--------	26,000	26,000	--------	348.07	9,050
32. Cucumber	--------	15,000	--------	15,000	--------	39.00	585
33. Teak	--------	--------	9,000	9,000	--------	350.00	3,150
34. Tamarack	--------	5,000	--------	5,000	--------	50.00	250
35. Redwood	--------	1,000	--------	1,000	--------	55.00	55
36. Holly	--------	1,000	--------	1,000	--------	126.00	126
37. Sycamore	--------	1,000	--------	1,000	--------	120.00	120
38. Boxwood	--------	--------	1,000	1,000	--------	120.00	120
Totals	7,555,000	213,419,000	1,450,000	222,424,000	100	$23.72	$5,323,073

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turing planing mill products. Furniture, cooperage, woodenware and novelties, boats and vehicles are also included in the local output.

This county manufactures products of eight kinds of wood, southern yellow pine being far in the lead. It is interesting to note that nearly one-half of this pine was grown in Maryland. Salisbury is one of the three principal centers of the State in point of wood-using industries.

TABLE 69—WICOMICO COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	12,985,000	13,885,000	--------	26,870,000	88	$17.72	$476,115
2. Red gum	1,870,000	250,000	--------	2,120,000	7	17.74	37,600
3. Oak species	243,000	380,000	--------	623,000	2	32.16	20,038
4. Cypress	--------	455,000	--------	455,000	1.5	39.69	18,025
5. Tulip poplar	125,000	125,000	--------	250,000	1	21.73	5,433
6. E. white pine	--------	100,000	--------	100,000	.5	40.00	4,000
7. Black gum	85,000	--------	--------	85,000	--------	17.94	1,525
8. Red maple	65,000	--------	--------	65,000	--------	17.93	1,165
Totals	15,373,000	15,195,000	--------	30,568,000	100	$18.45	$563,900

WASHINGTON COUNTY.

The forest industries of Washington County stand third in the State. A certain amount of material used is Maryland-grown, and foreign woods are also employed to a small extent. Manufacturing centers at Hagerstown, where furniture-making is the chief wood-using industry. Planing mill products are also got out to a large extent, and to a lesser degree vehicles, musical instruments, wooden boxes and novelties. The county has a present wooded area of 24 per cent.

There are 18 different kinds of wood used by the manufactories of Washington County, this being a larger variety than is

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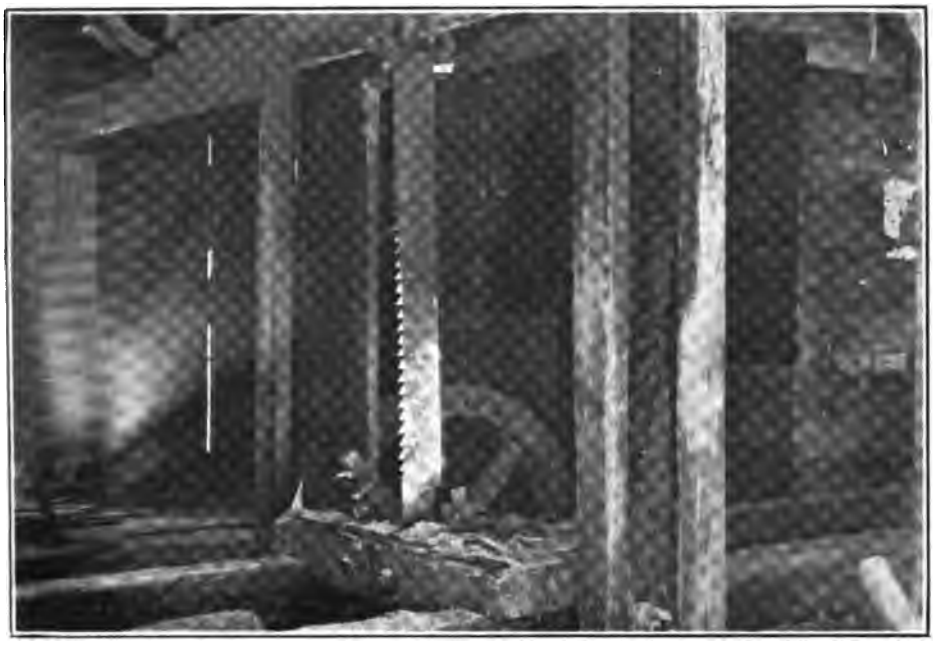

PLATE XX. FIG. 1—THE EARLY MILL.

Up-and-down saws once cut Maryland's lumber. Portable mills and circular saws have replaced them over the State, though the old type shown was operated recently in Harford County.

PLATE XX. FIG. 2—RED OAK CHAIR STOCK.

A Howard County portable mill is cutting this material, chiefly for chair legs, from local woodlands.

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shown by any other district outside of Baltimore. Oak leads in consumption, followed closely by yellow pine.

With Baltimore in the central section of the State and Salisbury on the Eastern Shore, Hagerstown is the third center of wood manufacturing in the State, with its numerous activities in Western Maryland. It is well situated in a strong network of railway lines, which add great importance to city and county in the shipping of both raw and finished products.

TABLE 70—WASHINGTON COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Oak species	1,595,000	5,070,000	--------	6,665,000	38	$32.29	$215,215
2. S. yellow pines	--------	3,400,000	--------	3,400,000	19	21.07	71,650
3. Hickory species	508,000	2,007,000	--------	2,515,000	14	14.19	35,700
4. Black locust	1,075,000	----------	--------	1,075,000	6	9.30	10,000
5. Basswood	--------	704,000	--------	704,000	4	25.67	18,072
6. Tulip poplar	--------	637,000	--------	637,000	4	30.00	19,109
7. Chestnut	50,000	445,000	--------	495,000	3	23.63	11,695
8. Cypress	--------	450,000	--------	450,000	3	33.22	14,950
9. Hard maple	--------	439,000	--------	439,000	3	22.89	10,049
10. Eastern spruce	--------	375,000	--------	375,000	2	33.60	12,225
11. Beech	10,000	298,000	--------	308,000	2	23.62	7,274
12. Birch species	--------	166,000	--------	166,000	1	26.87	4,460
13. Red gum	--------	105,000	--------	105,000	.5	26.57	2,790
14. E. white pine	50,000	40,000	10,000	100,000	.5	40.50	4,050
15. W. white pine	--------	50,000	--------	50,000	-------	61.00	3,050
16. Elm	--------	22,000	--------	22,000	-------	22.73	500
17. Ash species	15,000	----------	--------	15,000	-------	30.00	450
18. Mahogany	--------	----------	10,000	10,000	-------	145.00	1,450
Totals	3,308,000	14,208,000	20,000	17,561,000	100	$25.25	$442,689

WORCESTER COUNTY.

Worcester County is remarkable in that it used nearly five times as much Maryland wood as that produced outside the State. In Worcester County, six varieties of wood are manufactured:

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large quantities of yellow pines and red gum, with smaller amounts of oak, cypress, black gum and red maple. Four per cent. of the wood used in Maryland is utilized in Worcester County, which secures its material at a very low cost. Worcester County has the highest per cent. of forest land of any Eastern Shore county—47 per cent. of its total area now being wooded. This fact, together with natural shipping, manufacturing and labor advantages, is largely responsible for giving it so high a place in the industries of the State. The county manufactures baskets, boxes, cooperage and planing mill products in large amounts, also turning out boats, woodenware and novelties.

TABLE 71—WORCESTER COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	9,275,000	1,845,000	--------	11,120,000	80	$17.11	$190,255
2. Red gum	1,408,000	225,000	--------	1,633,000	12	18.36	29,985
3. Oak species	483,000	--------	--------	483,000	3	28.90	13,955
4. Cypress	--------	285,000	--------	285,000	2	36.05	10,275
5. Black gum	--------	250,000	--------	250,000	2	17.00	4,250
6. Red maple	134,000	--------	--------	134,000	1	29.85	4,005
Totals	11,300,000	2,605,000	--------	13,905,000	100	$18.18	$252,725

ANNE ARUNDEL COUNTY.

Anne Arundel County, fifth in the State, manufactures large quantities of southern yellow pine and smaller amounts of six other woods. Thirty-four per cent. of the total land area is covered with woodland, but very small amounts of local material are manufactured. Being close to Baltimore will account for some of the industries which are located across the river in Anne Arundel County, since shipping and employment advantages are almost equal there, with certain costs naturally less.

Large amounts of planing mill products are turned out, together with quantities of boxes and railway cars. A great deal of car repairing is also done.

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TABLE 72—ANNE ARUNDEL COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	100,000	10,637,000	--------	10,737,000	85	$19.98	$214,549
2. Black gum	--------	1,000,000	--------	1,000,000	8	13.50	13,500
3. Oak species	450,000	55,000	--------	505,000	4	32.92	16,625
4. Cypress	--------	165,000	--------	165,000	1	41.42	6,835
5. Tulip poplar	--------	100,000	--------	100,000	1	16.00	1,600
6. Douglas fir	--------	100,000	--------	100,000	1	45.00	4,500
7. E. white pine	--------	33,000	--------	33,000	--------	50.45	1,665
Totals	550,000	12,090,000	--------	12,640,000	100	$20.51	$259,274

DORCHESTER COUNTY.

Dorchester County used twice as much wood grown in Maryland as was brought in from outside to be manufactured there.

Boxes are first in order of importance, but planing mill products also lead. Baskets and boats are produced by the factories of the county.

TABLE 73—DORCHESTER COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	8,130,000	3,860,000	--------	11,990,000	96	$16.07	$192,630
2. Red gum	130,000	100,000	--------	230,000	2	17.22	3,960
3. Cypress	--------	180,000	--------	180,000	1.5	42.33	7,620
4. Oak species	40,000	--------	--------	40,000	.3	16.87	675
5. Yellow poplar	20,000	5,000	--------	25,000	.2	21.40	535
6. Eastern spruce	--------	10,000	--------	10,000	--------	38.00	380
Totals	8,320,000	4,155,000	--------	12,475,000	100	$16.50	$205,800

Six kinds of woods are used, with yellow pine the only variety handled in large amounts. The forest area of Dorchester County

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is 37 per cent. of the whole, and real, natural advantages are likely to increase rather than diminish this important branch of the county's activities.

FREDERICK COUNTY.

Frederick County shows a considerable diversity in industries. They are not many in number, but their consumption of wood and timber is high and the output very important. Sixteen kinds of wood are used, from yellow pine to mahogany. Pine, beech and Douglas fir stand first. Although Frederick has 21 per cent. in forest, practically none of the wood manfuactured in Frederick City is locally produced. The city is well located for manufacturing of any kind and the brushes, cooperage, planing mill products, and to a lesser extent baskets, which are the chief output, enjoy a tremendous demand and are of much importance to the city, county and State.

TABLE 74—FREDERICK COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	--------	3,060,000	--------	3,060,000	30	$28.40	$80,800
2. Beech	--------	2,500,000	--------	2,500,000	25	21.50	53,750
3. Douglas fir	--------	2,000,000	--------	2,000,000	20	31.50	63,000
4. Cypress	--------	550,000	--------	550,000	5.4	39.89	21,900
5. Sugar maple	--------	500,000	--------	500,000	5	23.50	11,750
6. Birch species	--------	500,000	--------	500,000	5	21.00	10,500
7. E. white pine	--------	350,000	--------	350,000	3.5	37.00	12,950
8. Chestnut	--------	175,000	--------	175,000	2	43.33	7,583
9. Oak species	--------	110,000	--------	110,000	1	44.09	4,850
10. Redwood	--------	100,000	--------	100,000	1	45.50	4,550
11. Tulip poplar	10,000	50,000	--------	60,000	.6	44.67	2,680
12. W. white pine	--------	60,000	--------	60,000	.6	65.00	3,900
13. Eastern spruce	--------	40,000	--------	40,000	.4	27.50	1,100
14. Hemlock	--------	40,000	--------	40,000	.4	25.00	1,000
15. Basswood	10,000	--------	--------	10,000	.1	17.00	170
16. Mahogany	--------	--------	3,000	3,000	-------	200.00	600
Totals	20,000	10,085,000	3,000	10,058,000	100	$37.94	$381,063

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SOMERSET COUNTY.

Somerset County has high rank among the manufacturing counties of the State. Like other sections of the Eastern Shore, much more Maryland than foreign-grown wood is used. Seven kinds of wood are demanded, and yellow pine, which is an important timber locally, is far in the lead. Twenty-five per cent. of the county is still in woodland and an important source of the pine which is so largely used.

Boxes, baskets and planing mill products lead, with cooperage and boats also manufactured. Like the other counties of the Eastern Shore, veneered fruit packages make up a large part of the output.

TABLE 75—SOMERSET COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	5,850,000	2,360,000	--------	8,210,000	90	$15.61	$128,125
2. Red gum	450,000	----------	-------	450,000	5	16.00	7,200
3. Oak species	310,000	----------	--------	310,000	3	22.26	6,900
4. Black gum	70,000	----------	--------	70,000	1	15.86	1,110
5. Cypress	--------	50,000	--------	50,000	1	37.50	1,875
6. Beech	5,000	----------	--------	5,000	-------	18.00	90
7. Red maple	5,000	----------	--------	5,000	-------	18.00	90
Totals	6,690,000	2,410,000	--------	9,100,000	100	$15.98	$145,390

CAROLINE COUNTY.

Caroline County is largely wooded—30 per cent.—and this is reflected in the activity of its forest industries. These used seven kinds of wood in commercial quantities, southern yellow pine leading. Most of the yellow pine is Maryland-grown, and, in fact, but one-third of all wood used is grown outside of Maryland. Caroline County handles the cheapest wood of any county in the State, paying but $15.80 per thousand for it at the factory.

In manufacturing, boxes lead, followed by baskets in large amounts and also planing mill products.

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TABLE 76—CAROLINE COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	2,525,000	1,655,000	--------	4,180,000	91	$15.38	$64,275
2. Red gum	300,000	----------	--------	300,000	7	18.79	5,638
3. Tulip poplar	50,000	----------	--------	50,000	1	18.50	925
4. Cypress	---------	25,000	--------	25,000	.5	40.00	1,000
5. Black gum	25,000	----------	--------	25,000	.5	19.00	475
6. Oak species	15,000	----------	--------	15,000	--------	18.00	270
7. Red maple	5,000	----------	--------	5,000	--------	19.00	95
Totals	2,920,000	1,680,000	--------	4,600,000	100	$15.80	$72,678

CECIL COUNTY.

This county, although not particularly active in the manufacture of wood, nevertheless has one product of local importance. This industry, which is practically the only one in the county where wood is used in large measure, is the manufacture of boats. Three woods only are used: yellow pine. oak and cedar. All of the oak is grown in Maryland and none of the others. Twenty-four per cent. of Cecil County is wooded. Its important stands of chestnut and oak have been and are being rapidly removed.

TABLE 77—CECIL COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. Yellow pines	---------	1,925,000	--------	1,925,000	74	$38.29	$73,700
2. Oak species	550,000	----------	--------	550,000	21	20.00	11,000
3. Cedar species	---------	125,000	--------	125,000	5	40.00	5,000
Totals	550,000	2,050,000	--------	2,600,000	100	$34.50	$89,700

TALBOT COUNTY.

The manufacture of wood in Talbot County is diversified—boats, planing mill products, boxes, furniture and vehicles all be-

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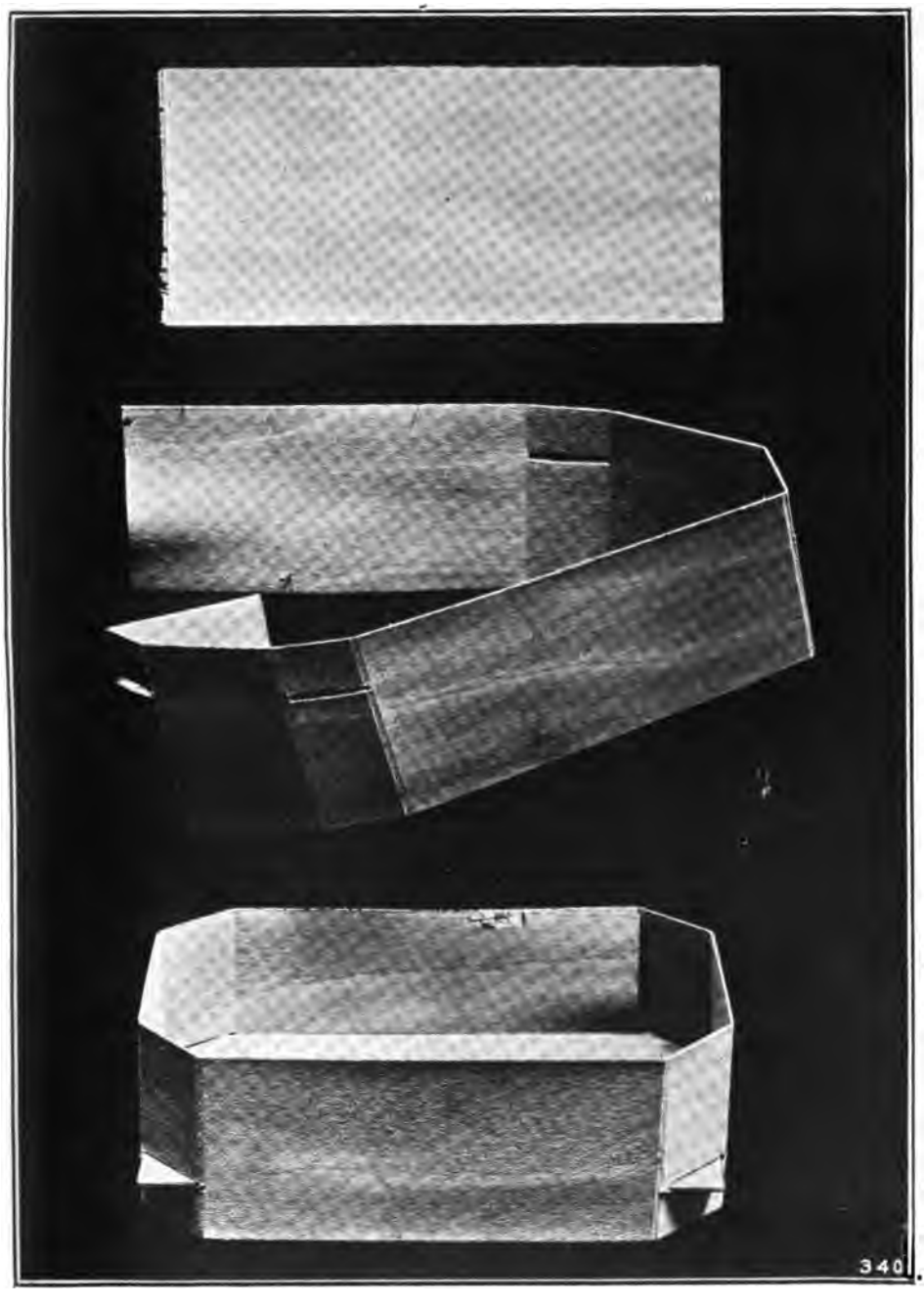

PLATE XXI. OCTAGON BERRY BOX.

Berry boxes and other fruit containers are important to the Eastern Shore. To a large extent they are manufactured of local woods and later used for fruits grown in the same sections.

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ing produced. Six kinds of woods are used, the oaks and southern yellow pines being in chief demand. A considerable quantity of the wood employed is grown in Maryland, and much of this comes from the 29 per cent. of Talbot County which is in forest land.

TABLE 78—TALBOT COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Oak species	355,000	895,000	--------	1,250,000	59	$29.15	$36,443
2. S. yellow pines	240,000	322,000	--------	562,000	23	16.12	9,606
3. Tulip poplar	20,000	280,000	--------	300,000	13	20.00	6,000
4. Chestnut	--------	160,000	--------	160,000	7	18.00	2,880
5. Cypress	--------	101,000	--------	101,000	4	54.08	5,462
6. Red gum	30,000	--------	--------	30,000	1	16.00	480
Totals	645,000	1,758,000	--------	2,403,000	100	$25.59	$60,871

GARRETT COUNTY.

Garrett County, although possessing 63 per cent. of its area in woodland, the highest portion of any county in the State, is hardly a manufacturing region. This would naturally be so, since it is placed in the western part of the State, and somewhat removed by location and shipping facilities from the larger markets of Maryland and adjoining States. It is rather a producing than a manufacturing county, since practically nothing but planing mill products are got out in commercial quantities. Oak and hemlock, hard maple, southern yellow pine and tulip poplar are the chief woods used, a small amount of oak and tulip poplar coming from Maryland. The forests of Garrett County were once probably as fine as any woodland occurring in the East, though this is now changed and there is very little virgin timber left. The material standing, chiefly hardwoods, still represents a rich store of unused and usable forest material, although it is not likely that manufacturing locally will ever play a very important part. As to the forests of Garrett County, it is certain that their annual

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production in timber and unmanufactured forest products will continue of great value and importance to both the county and the State.

TABLE 79—GARRETT COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Oak species	7,000	1,016,000	--------	1,023,000	47	$31.96	$32,700
2. Hemlock	--------	600,000	--------	600,000	28	18.00	10,800
3. Hard maple	--------	407,000	--------	407,000	19	32.31	13,150
4. S. Yellow pines	--------	75,000	--------	75,000	3	27.00	2,025
5. Tulip poplar	25,000	30,000	--------	55,000	3	20.00	1,100
Totals	32,000	2,128,000	--------	2,160,000	100	$27.67	$59,775

KENT COUNTY.

This is a county which is chiefly devoted to progressive agricultural uses. Only 19 per cent. of it is wooded, but nevertheless some manufacturing is done. Boxes and baskets are made, as well as planing mill products, and nearly one-half of the material utilized is grown in Maryland. All of the gum and oak are native, and one-half of the pine. Cypress is brought in altogether from outside, as also a large part of the elm and yellow poplar which are used in local industries.

TABLE 80—KENT COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	200,000	400,000	--------	600,000	37	$21.00	$12,600
2. Red gum	450,000	--------	--------	450,000	28	17.61	7,925
3. Tulip poplar	75,000	175,000	--------	250,000	16	16.50	4,125
4. American elm	25,000	175,000	--------	200,000	12	16.50	3,300
5. Cypress	--------	100,000	--------	100,000	6	40.00	4,000
6. Oak species	6,000	--------	--------	6,000	-------	35.00	210
Totals	756,000	850,000	--------	1,606,000	100	$20.02	$32,160

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ALLEGANY COUNTY.

The status of the wood-using industries in Allegany County is very similar to that of Garrett County, and for the same reasons. Sixty-two per cent. of the county is in woodland, and a certain amount of the large annual cut is devoted to local industries and the manufacture of planing mill products. Eight varieties of wood are used—pine, poplar and oak being the leaders. This county is more important for its unmanufactured forest products and its reserves of merchantable timber, which rising prices and increased demands are daily making more accessible.

TABLE 81—ALLEGANY COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	---------	497,000	--------	497,000	40	$19.73	$9,806
2. Tulip poplar	30,000	187,000	--------	217,000	18	27.17	5,896
3. Oak species	74,000	107,000	--------	181,000	15	35.44	6,415
4. Cypress	---------	96,000	--------	96,000	8	36.94	3,546
5. Chestnut	66,000	25,000	--------	91,000	7	15.50	1,410
6. E. white pine	39,000	12,000	--------	51,000	4	35.94	1,833
7. Hemlock	50,000	----------	--------	50,000	4	18.00	900
8. Sugar pine	---------	50,000	--------	50,000	4	45.00	2,250
Totals	259,000	974,000	--------	1,233,000	100	$26.00	$32,056

CALVERT COUNTY.

This is the smallest county, but nevertheless ranks fifteenth in the State in importance of wood-using industries. Boats are its chief product, for which yellow pine and oak are exclusively used. All of the oak and none of the pine comes from Maryland.

TABLE 82—CALVERT COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. S. yellow pines	---------	950,000	--------	950,000	79	$38.26	$36,350
2. Oak species	260,000	----------	--------	260,000	21	31.15	8,100
Totals	260,000	950,000	--------	1,210,000	100	$36.74	$44,450

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CARROLL COUNTY.

Only 13 per cent. of this county is in forest land, and it is therefore not remarkable that this county pays the highest prices in Maryland for the wood which it manufactures. It is a stirring argument in favor of local production for home consumption. A small amount of manufacturing is carried on, the output being confined to vehicles, cooperage and planing mill products. Although small amounts of wood are used, there are nine varieties in all. Practically all of this was grown outside of Maryland.

TABLE 83—CARROLL COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Chestnut	---------	125,000	--------	125,000	34	$40.00	$5,000
2. S. yellow pines	---------	80,000	--------	80,000	22	30.00	2,400
3. Oak species	8,000	57,000	--------	65,000	18	42.60	2,769
4. Tulip poplar	2,000	50,000	--------	52,000	14	50.77	2,640
5. Cypress	---------	20,000	--------	20,000	5	40.00	800
6. Hickory species	3,000	7,000	--------	10,000	3	35.40	354
7. Red gum	7,000	---------	--------	7,000	2	32.00	224
8. Beech	---------	7,000	--------	7,000	2	32.00	224
9. Ash species	1,000	1,000	--------	2,000	--------	85.00	170
Totals	21,000	347,000	--------	368,000	100	$39.62	$14,581

MONTGOMERY COUNTY.

Montgomery is not a heavily wooded county, only 22 per cent. of it being in forest land, and this confined mostly to small farm woodlots. However, ten times as much Maryland wood is used as that grown outside the State. In fact, much of the wood which is used comes from the county itself. Oak, chestnut, pine, poplar, basswood and cottonwood are being utilized in Montgomery County for the manufacture of furniture, boxes and planing mill products.

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PLATE XXII. THE BETTER SORT OF OFFICE.

Mahogany, ebony and maple are combined in finish and furniture to make an office homelike, modern and comfortable. Attractive woods rightly used contribute substantially to any business.

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TABLE 84—MONTGOMERY COUNTY.

Kind of Wood.	Maryland.	United States.	Foreign.	Total Bd. Ft.	Per Cent. of Whole.	Av. Cost Per M at Factory.	Total Cost F. O. B. Factory.
1. Oak species	90,000	----------	--------	90,000	41	$32.22	$2,900
2. Chestnut	70,000	----------	--------	70,000	32	38.57	2,700
3. S. yellow pines	25,000	10,000	--------	35,000	16	28.86	1,010
4. Tulip poplar	15,000	----------	--------	15,000	7	45.00	675
5. Basswood	----------	5,000	--------	5,000	2	30.00	150
6. Cottonwood	----------	5,000	--------	5,000	2	30.00	150
Totals	200,000	20,000	--------	220,000	100	$34.48	$7,585

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APPENDIX

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STATE'S DIRECTORY OF MANUFACTURERS

(Firms furnishing data.)

1. Boxes and Crates.

A. A. Gassinger & Son	403-11 W. Barre st	Baltimore
C. C. Lurssen's Sons Co	Mount & Cole sts	Baltimore
H. F. Radecke & Sons	Bush & Ridgely sts	Baltimore
Wm. H. Asendorf & Co	Russell & Stockholm sts	Baltimore
J. H. Duker Co	Aliceanna & Eden sts	Baltimore
Canton Box Co	2515 Boston st	Baltimore
Henry D. Lewis	1402-4 Leadenhall st	Baltimore
Wm. Suchting & Sons	605 Portland st	Baltimore
Chas. Fortenbaugh	636 W. Pratt st	Baltimore
Balto. Box & Shook Co	901 S. Caroline st	Baltimore
H. D. Dugan & Co	Aliceanna st	Baltimore
Rittler Box Co	613-21 S. Caroline st	Baltimore
Union Box Co	708 Aliceanna st	Baltimore
Acme Box Co	Eden & Fleet sts	Baltimore
Steiner Mantel Co	8th st & Fairmount ave	Baltimore
Geo. E. Iglehart Co	5th lane & 14th st	Baltimore
Southern Can Co	717 S. Wolfe st	Baltimore
Continental Can Co	Highlandtown	Baltimore
Balto. Mill & Cabinet Co	407-9 Dover st	Baltimore
John Clark & Co	411-13 Camden st	Baltimore
A. Weiskittel Sons & Co	Lombard st	Baltimore
Woolford & Smith		Cambridge
A. B. Cochran Co		Crisfield
Tawes & Gibson		Crisfield
W. C. Meier Co		Crisfield
G. T. Reddin & Co		Denton
Hughes Lumber & Coal Co		Denton
H. C. Hobbs		Denton
East Brooklyn Box Co		East Brooklyn
J. B. Webster & Co		East New Market
Easton Furniture Mfg. Co		Easton
L. S. Fleckenstein & Son		Easton
J. C. Foster & Co		Federalsburg
Benjamin & Graham Co		Fruitland

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Chatham Bros.	Fruitland
H. H. Moore	Greensboro
Hagerstown Furniture Co	Hagerstown
B. O. Hudson Co	Harold
G. A. Thompson & Sons	Hurlock
Wm. A. Sparklen	Oxford
Marvel Package Co	Pocomoke
Eastern Shore Co	Powellsville
Phillipps & Douglas	Preston
Princess Anne Milling Co	Princess Anne
Cohn & Bock	Princess Anne
Day, Swing & Co	Ridgely
Samuel W. Wheatley	Rhodesdale
G. E. Leary & Son	Rock Hall
Huston Sons Co	Salisbury
C. R. Dickerson & Co	Salisbury
Morris Bros. & Co	Salisbury
E. S. Adkins & Co	Salisbury
Jackson Bros. & Co	Salisbury
D. J. Elliott	Salisbury
L. E. Williams & Co	Salisbury
J. H. Tomlinson	Salisbury
Marvel Package Co	Sharptown
Showell Mfg. Co	Showell
Godfrey Mfg. Co	Snow Hill
Snow Hill Butter-Dish & Basket Co	Snow Hill
The Corddrey Co	Snow Hill
Wango Mfg. Co	Wango
Washington Grove Mfg. Co	Washington Grove
G. V. Teeters	Westover
Poco-Wico Co	Willards
Grover Davis	Willards
Petey Mfg. Co	Whaleysville
Wimbrow Bros	Whaleysville

2. PLANING MILL PRODUCTS.

Farinholt-Meredith Co		Annapolis
W. B. Gardiner		Annapolis
Canton Lumber Co	Boston st., ft. of Kenwood	Baltimore
Jas. Thomas & Son	Leadenhall & Henrietta sts.	Baltimore
Wm. D. Gill & Son, Inc	1311 Philpot st	Baltimore
L. H. Poehlman & Sons	340 Frederick ave	Baltimore
John F. Wilson Co	Frederick road	Baltimore
Schoppert & Spates	Front & Low sts	Baltimore
Balto. Sash & Door Co	Cor. Howard & West sts	Baltimore
Otto Duker	Albemarle & Fleet sts	Baltimore

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Horstmeier Lumber Co.	305 E. Falls ave.	Baltimore
Kelly Sawing & Planing Mills	Fleet and President sts.	Baltimore
Heise & Bruns Co.	600 S. Caroline st.	Baltimore
Sloane Lumber Co.	114 Light st.	Baltimore
Pioneer Hardwood & Flooring Co.	Canton ave. & President st.	Baltimore
Wm. C. Scherer & Co.	808-12 W. Baltimore st.	Baltimore
Wm. C. Dorsey	Phila. rd. & Highlandtown	Baltimore
J. L. Gilbert & Bros.	E. Falls & Eastern ave.	Baltimore
Atlantic Mill & Lumber Co.	Dock st. & Wharf	Baltimore
McCoy, Easter Co.	Clifton ave. & W. M. R. R.	Baltimore
Solmson Fly Screen Co.	Bayard & Nanticoke sts.	Baltimore
Tinley Bros. Co.	Bush & Nanticoke sts.	Baltimore
W. W. Bosley & Co.	Bayard & Nanticoke sts.	Baltimore
Jones Woodwork Co.	625-27 Portland st.	Baltimore
Summer & Gerlach	1401 N. Regester st.	Baltimore
Lafayette Mill & Lumber Co.	Lafayette ave. & P., B. & W. R. R.	Baltimore
Louis Heim	831 S. Caroline st.	Baltimore
Balto. Mill & Cabinet Co.	407-9 Dover st.	Baltimore
John Dittmar & Sons	800 E. Pratt st.	Baltimore
J. H. Geis & Co.		Brooklyn
Brooklyn Bldg. & Supply Co.		Brooklyn
Cambridge Mfg. Co.		Cambridge
W. S. & A. M. Culp		Chestertown
Kendall Lumber Co.		Crellin
Tawes & Gibson		Crisfield
W. C. Meier Co.		Crisfield
F. Martens Sons		Cumberland
Cumberland Sash & Door Co.		Cumberland
Cessna Lumber Co.		Cumberland
W. Md. Lumber Co.		Cumberland
Cumberland Lumber Co.		Cumberland
Hughes Lumber & Coal Co.		Denton
L. S. Fleckenstein & Son		Easton
C. N. Lowery		Ellerslie
J. B. Webster & Co.		East New Market
W. D. Bowers Lumber Co.		Frederick
Wilcoxon & Brown		Frederick
C. S. Jeffries		Frostburg
Benjamin & Graham Co.		Fruitland
Wm. J. Lewis		Gaithersburg
Edgar Fulks		Gaithersburg
Jamison (formerly Jones Cold Storage Door Co.		Hagerstown
West Side Lumber & Door Co.		Hagerstown
Danzer Lumber Co.		Hagerstown

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S. Rinehart Cohill.....Hancock
G. A. Thompson & Sons.....Hurlock
Marshall Bros.....Lonaconing
People's Lumber Supply Co., Inc.....Mt. Airy
C. M. Rathbun & Sons.....Oakland
Phillipps & Douglas.....Preston
Princess Anne Milling Co.....Princess Anne
Cohn & Bock.....Princess Anne
Young & Sons.....Pocomoke
Quince Ashburne.....Pocomoke
Huston Sons Co.....Salisbury
Morris Bros. Co.....Salisbury
Salisbury Woodworking Co.....Salisbury
L. E. Williams & Co.....Salisbury
Godfrey Mfg. Co.....Snow Hill
The Corddry Mfg. Co.....Snow Hill
Smith & Reifsnyder.....Westminster
Lumber, Coal & Supply Co. of Carroll County.....Westminster
E. B. Maloney.....Williston

3. TANKS, SILOS, COOPERAGE.

Balto. Cooperage Co.....Stockholm & Leadenhall sts.Baltimore
Fred'k Albrecht .....Pratt & Smallwood sts.....Baltimore
Reahl Bros.....2022 Frederick ave.....Baltimore
F. Schlimme.....620-6 Portland st.....Baltimore
John Reahl.....1653 Ridgely st.....Baltimore
Emil Dahms.....S. E. cor. 4th & Hudson sts..Baltimore
David Garratt.....1209 S. Bouldin st.....Baltimore
The Economy Silo Mfg. Co.....Frederick
Corddry & Chandler.....Fruitland
C. W. Pilchard.....Girdletree
W. J. Hall.....Marion
Wm. B. Duncan.....Pocomoke
Peninsula Produce Exchange.....Pocomoke
Z. Cherrix.....Snow Hill
P. Wharton & Son.....Stockton
Oystermen's Barrel Co.....Stockton
Englar & Sponsellar.....Westminster

4. CAR CONSTRUCTION.

Maryland Steel Co.....Sparrows Point.....Baltimore
Mt. Clare Shops (B. & O.
R. R.).....W. Pratt st.....Baltimore
Balto. Car & Foundry Co.....Curtis Bay

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5. FURNITURE.

A. A. Gassinger & Son	403-11 W. Barre st	Baltimore
Hughes Furniture Mfg. Co.	Haubert & Beason sts	Baltimore
O'Keefe Bros	500 Frederick ave	Baltimore
M. Pimes & Co	300-14 N. Front st	Baltimore
Becker Bros. & Son, Inc.	Lexington st & Fred'k road	Baltimore
Reliable Furniture Mfg. Co.	305 President st	Baltimore
Bagby Furniture Co	Eastern ave	Baltimore
J. C. Knipp & Sons	218-20 Clay st	Baltimore
Levenson & Zenitz	Howard & Ostend sts	Baltimore
Steiner Mantel Co	8th st. & Fairmount av	Baltimore
Harry Roesch & Sons	331-35 S. Fremont st	Baltimore
Chesapeake Mfg. Co	Sharp & Barre sts	Baltimore
Potthast Bros	1438 Wicomico st	Baltimore
Balto. Mill & Cabinet Co.	407-9 Dover st	Baltimore
John Dittmar & Sons	800 E. Pratt st	Baltimore
Easton Furniture Mfg. Co		Easton
Brandt Cabinet Works		Hagerstown
Hagerstown Lounge Co		Hagerstown
Hagerstown Table Works		Hagerstown
Hagerstown Furniture Co		Hagerstown
Main Furniture Co., Inc		Hagerstown
Hagerstown Mantel & Furniture Co		Hagerstown
Harry Wilson		Salisbury
Washington Grove Mfg. Co		Washington Grove

6. SHIP AND BOAT BUILDING.

John S. Beacham	900 Key Highway	Baltimore
Balto. Dry Docks & Shipbuilding Co	Ft. of Cross st., Locust Pt.	Baltimore
Spedden Shipbuilding Co.	Boston st. & Kenwood ave.	Baltimore
Chas. L. Rohde & Sons Co.	Foot of 3rd st	Baltimore
Chesapeake Marine Railway Co	S. E. cor. Philpot & Point sts.	Baltimore
Md. Steel Co	Sparrows Point	Baltimore
Wm. E. Woodall & Co	Foot of Woodall st	Baltimore
Chesapeake Ship-Ceiling Co.	901 Fell st	Baltimore
C. Durm & Son	Foot of Hanover st	Baltimore
Thompson Engine & Yacht Co.	Foot of Charles st	Baltimore
Nelson Yacht Bldg. Co	Ferry Bar	Baltimore
Thames Yacht Bldg. Co	Ferry Bar	Baltimore
Booz Bros	15-19 Key Highway	Baltimore
Md. Dredging & Contr. Co.	Foot of Woodall st	Baltimore
Lewis Waggner Co	17 S. Gay st	Baltimore

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Wm. A. Hoare	Colgate Creek	Baltimore
Cambridge Mfg. Co		Cambridge
Southern Transportation Co		Chesapeake City
J. B. Nelson		Crisfield
E. Deibert & Co		Elkton
S. J. Cooper		Oxford
Wm. A. Sparklen		Oxford
E. Jas. Tull		Pocomoke
Smith & Williams Co		Salisbury
Sharptown Marine Railway Co		Sharptown
M. M. Davis & Son		Solomon's Island
C. L. Marsh		Solomon's Island

7. BASKETS.

Acme Basket Co	739 W. Lexington st	Baltimore
The Wysham Co	106 S. Hanover st	Baltimore
Berlin Veneer Works		Berlin
Cambridge Mfg. Works		Cambridge
Marvel Package Co		Chestertown
H. C. Hobbs		Denton
J. E. Foster & Co		Federalsburg
Benjamin & Graham Co		Fruitland
H. H. Moore		Greensboro
Elmer Wolf		Lantz
Marvel Package Co		Pocomoke
Eastern Shore Mfg. Co		Powellsville
Princess Anne Milling Co		Princess Anne
Cohn & Bock		Princess Anne
Day, Swing & Co		Ridgely
G. E. Leary & Son		Rock Hall
C. R. Disharoon Co		Salisbury
D. J. Elliott		Salisbury
J. H. Tomlinson		Salisbury
Marvel Package Co		Sharptown
Showell Mfg. Co		Showell
Snow Hill Butter-Dish & Basket Co		Snow Hill
Wango Mfg. Co		Wango
G. V. Teeters		Westover
Petey Mfg. Co		Whaleysville
Wimbrow Bros		Whaleysville
Poco-Wico Co		Willards
Grover Davis		Willards

8. FIXTURES.

Reinle, Salmon Co	Warner & Stockholm sts	Baltimore
M. L. Himmel & Sons	107 N. Frederick st	Baltimore

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F. X. Ganter Co.....Sharp & Ostend sts.....Baltimore
Ruse & Co.....808 Low st.....Baltimore
Postal Mfg. Co.....206 W. Frederick st.....Baltimore
A. Herman.....762-64 Vine st.....Baltimore
Balto. Mill & Cabinet Co...407-9 Dover st.....Baltimore
John Clark & Co.....411-13 W. Camden st.....Baltimore
L. H. Wiebel.....Hagerstown
Hagerstown Mantel & Furniture Co.....Hagerstown

9. CASKETS AND COFFINS.

National Casket Co. (Baltimore Branch).....E. Falls ave. & Lombard st..Baltimore

10. BRUSHES.

Brownwell Brush & Wire Goods Co.....Eager & Forrest sts.....Baltimore
Ox-Fibre Brush Co.....Frederick

11. VEHICLES AND VEHICLE PARTS.

Kunkel Wagon Co.....29-37 E. Lee st.....Baltimore
Martin L. McCormick & Bro..2601 Pennsylvania ave.....Baltimore
Edw. Stinson Mfg. Co.....327-35 Guilford ave.....Baltimore
Leonhardt Wagon Mfg. Co..417 E. Saratoga st.....Baltimore
Chas. R. Sefton.....1401 E. Monument st.....Baltimore
C. E. Hosbach Co.....808-12 E. Fayette st.....Baltimore
Balto. Hub Wheel & Mfg. Co..Fallsway & Gay st.....Baltimore
Herman Born & Sons.....Fremont & Waesche sts....Baltimore
Ditch, Bowers & Taylor, Inc..North & Mt. Royal aves....Baltimore
Aug. Jass & Sons.....798 Waesche st.....Baltimore
E. Lehnert & Sons.....221-23 North st.....Baltimore
Francis T. Lynch.....336 N. Calvert st.....Baltimore
John C. Raum & Sons.....407 S. Sharp st.....Baltimore
John G. Mann & Son.....4255 Harford road.....Baltimore
C. E. Eckenrode & Co.....16-20 N. Carrollton ave....Baltimore
Jacob Eirmann.....906-8 Fell st.....Baltimore
Wm. Potter & Son.....2124 Eastern ave.....Baltimore
C. F. Roche.....Falls road.....Baltimore
Carl Spoerer & Sons.....901 S. Carey st.....Baltimore
Hess Carriage Co.....Hagerstown
Hollingsworth Wheel Co.....Hagerstown
J. W. Gordy.....Salisbury
Herr & Babylon.....Westminster
John E. Eckenrode & Son.....Westminster

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12. PICTURE FRAMES AND MOLDINGS.

Furst Bros. & Co.	Ostend & Race sts.	Baltimore
Henry H. Hall, Jr.	356 W. Pratt st.	Baltimore
Conrad Hamp & Co.	608-18 Portland st.	Baltimore

13. INSTRUMENTS, MUSICAL.

Adam Stein	5-7 N. Greene st.	Baltimore
Stieff Piano Co.	Lafayette ave. & Aiken st.	Baltimore
American Piano Co. (Knabe Branch)	Eutaw & West sts.	Baltimore
M. P. Moller Organ Works		Hagerstown

14. BOXES, CIGAR.

J. Henry Fisher & Sons	14-16 W. Barre st.	Baltimore
John C. Hendricks	201 W. Conway st.	Baltimore
J. H. Henschen	1022 Sharp st.	Baltimore
Otto Bregenzer	1003 China st.	Baltimore

15. WOODENWARE AND NOVELTIES.

John Dittmar & Sons	800 E. Pratt st.	Baltimore
Wm. A. Rock	407-9 N. Paca st.	Baltimore
Otto Bregenzer	1003 China st.	Baltimore
Martin Kesmodel, Jr.	116 Park ave.	Baltimore
Fr. Bergner & Co.	Paca & Cross sts.	Baltimore
Berlin Veneer Co.		Berlin
Modern Mfg. Co.		Hagerstown
Harry Wilson		Salisbury

16. TOYS.

International Wood & Paper Products Corporation	117 N. Calverton road	Baltimore
Carriage & Toy Co.	737-41 W. Lombard st.	Baltimore

17. PORTABLE HOUSES.

C. D. Pruden Co.	Dock & Warner sts.	Baltimore

18. TRUNKS AND VALISES (LUGGAGE).

Wm. A. Tuerke	212 E. Lexington st.	Baltimore
Jones & Schwartzkopf	1222-32 Greenmount ave.	Baltimore
C. J. Dunn & Co.	102 N. Charles st.	Baltimore

19. MOLDS AND PATTERNS.

A. Weiskittel & Sons Co.	Lombard st.	Baltimore

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PRINCIPAL FOREST PRODUCTS.

("The Forests of Maryland.")

The most important use of the forest, here, as elsewhere, is for *Lumber*. The production for 1914 amounted to 229,027,500 board feet, 129,105,500 board feet being hardwood and 99,922,000 pine, with a very small proportion of hemlock. This represents a value at the mills of $3,823,463. There are only a few large stationary mills in the State, the bulk of the lumber being cut by portable mills of varying size and kind, whose capacity usually runs from 4,000 to 12,000 board feet daily. These mill operators engage in buying timber lots, and move from place to place as new tracts are found. Most of the pine lumber is cut in the Eastern Shore and southern sections of the State, while the bulk of the hardwood comes from Central and Western Maryland.

The lumber production of the State has decreased in the last few years because of the exhaustion of large stumpage holdings in the western part of the State, so that now the lumber business is more generally distributed but not so important. It is believed, however, that a more stable condition has been reached, and that the present cut may be continued for many years, or actually increased under better systems of forest management. With reduced supplies of stumpage and increased prices, there is a strong tendency toward closer cutting and utilization to a smaller diameter limit.

PULPWOOD.

While the pulpwood business ranks next in importance to that of lumber, with a value of $444,029 and a cut of 74,002 long cords as reported in 1914, its field of activity is much more localized, as two-thirds of the production is from five Southern Maryland counties—Prince George's, Charles, Anne Arundel, St. Mary's and Calvert. Fully nine-tenths of the pulpwood is furnished by three species—scrub pine, red gum and tulip poplar.

Scrub pine, a tree which comes in quickly on abandoned fields in Southern Maryland, and which up to 12 years ago had no value

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except for cordwood, is now the most extensively used for pulpwood, making up practically two-thirds of the total production. The trees are generally cut during late spring and summer, when they peel most readily. The bark is removed, and the stems are cut into five-foot sections. After remaining piled in the woods until they have become partially seasoned, the wood is hauled to railroad or water shipping points and sent to the various pulp mills, generally to be shipped outside of the State. Practically all of the wood is handled by dealers who usually buy it on the stump, having the cutting and piling done by day labor or by contract.

Red gum, a timber tree growing in swampy land in the southern part of the State, is also extensively used for pulpwood, and with tulip poplar, which makes the best pulpwood of any of the native species and is cut for the purpose over a wider area than any other, forms most of the remaining third of the total output.

RAILROAD TIES.

The 925,392 railroad ties valued at $440,685, as reported in 1914, indicate the importance of this business. Railroad ties are cut in all parts of the State, although the Eastern Shore section contributes but a small per cent., and since little capital is required to produce them and they are salable at the nearest railroad point, there are great numbers of producers. A ready market and little expense of manufacture stimulate the cutting of a great many small, thrifty trees for this use before they have reached the most profitable merchantable size.

White oak, always a preferred tie material, formerly constituted the larger part of the product, but it is now becoming scarce, and other oaks are being largely substituted, especially where preservative treatment is possible. The principal species used are white oak, red oak (several species), chestnut and a small per cent. of pine.

PILING.

The counties bordering the Chesapeake Bay and its tributaries contribute the great bulk of the piling that is produced in the State. Of the amount produced probably three-fourths is oak, and the remainder principally pine. White oak, because of its greater strength and durability, brings a higher price, but several

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of the red oaks, particularly pin oak, which generally produces long, straight stems suitable for the purpose, are much used. Pine is the cheapest and most easily obtained in desired shapes, but it is the least durable.

CORDWOOD.

The 85,355 cords of woods valued at $270,380, reported as sold in 1914, represent but a small portion of the wood used in the State, since no account was made of that cut and used for home consumption. Of the amount produced, approximately one-third was hardwood, chiefly oak and chestnut, while the remainder was principally pine. It is a low-grade product which cannot be profitably shipped for any great distance, and therefore the principal markets are found in the nearby towns where the local demand is usually supplied, directly to the consumer, by the adjacent landowners.

MINE PROPS.

This industry is confined principally to two widely separated sections of the State—the Eastern Shore peninsula and Western Maryland—and the size of props, woods used and method of sale are entirely different in the two localities. In the Eastern Shore section loblolly pine forms practically the entire output, and props 27 to 36 feet long are cut from the larger trees.

Trees ordinarily used for this purpose are from 14 to 20 inches in diameter and the product is generally sold by the ton. The props are shipped to the anthracite coal fields and there cut into suitable lengths. The production for this section, as reported in 1914, was 56,787 tons. Since the trees cut for mine props are also of a suitable size for saw timber, the two uses are competing, and the length of haul is generally the determining factor. The mine props cannot be hauled profitably for as great a distance as lumber, and therefore where the haul exceeds three miles the product generally goes into saw timber instead of mine props.

The other section of the State where the cutting of mine props is an important business is in the vicinity of the coal fields in Western Maryland. The mine prop output coming from the three westernmost counties—Garrett, Allegany and Washington—amounted in 1914 to 46,550 tons. The props used, however, in the coal mines

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of Western Maryland are very different from those produced in the southeastern part of the State, particularly in the size of the trees cut for the purpose, and in that *all* species of suitable size are cut. Round props, measuring four inches at the top and varying in length from eight to twelve feet, are required, and a great variety of wood is used. In the logging operations here the very small trees, left after lumbering for saw timber or for railroad ties, are cut into mine props which are sold at a price little more than covering the cost of production and freight, with little, if any, allowance for stumpage value.

A few of the large-sized mine props are cut in Southern Maryland from scrub pine, but they form a very small per cent. of the total production for the State.

TAN BARK.

Tan bark was produced in seven of the western and central counties of the State in 1914, the total production being 34,360 tons, valued at $253,510. Of this, hemlock constituted nearly two-thirds of the total production; oak, principally chestnut oak, the remainder. The amount of bark produced in this section was very much greater a few years ago, but with the exhaustion of the main timber supplies the production of bark has decreased with that of lumber, of which it may be termed a by-product. There are now three large tanneries in the State, and a few small ones, which receive most of their supply of bark from Maryland. For the past twenty years there has been a sharp decline in this industry, due to the rapid exhaustion of chestnut oak and hemlock timber supplies.

STAVES AND HEADING.

This represents a production of 30,389,019 pieces valued at $223,931, and reported from five counties. About half of the number were barrel staves and headings, the remainder keg staves and headings. Pine constituted nine-tenths of the wood used, and of the remainder, consisting of several species, chestnut was the most important. The barrel staves were principally for oyster and vegetable containers, the bulk of them being used locally, while practically all of the keg staves were sent out of the State, their principal use being for nails, bolts, horseshoes, etc. In cutting keg

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staves small trees are often utilized, the most desirable size being six to eight inches in diameter. The tops are utilized to a diameter of three inches.

POLES.

The cut of poles reported was 62,135, with a value of $180,042. Practically all of the western, central and southern counties contributed to this output, of which nearly all was chestnut, the only exception being 4,000 white cedar and cypress poles cut along the Pocomoke River and its tributaries in Worcester and Wicomico counties. Many small poles are used in local telephone lines, but the bulk of them are shipped out of the State. The chestnut blight, which is so seriously affecting the chestnut trees, has forced great quantities of chestnut on the market in the past few years, causing over-production, with resulting low prices.

SHINGLES.

The 13,842,000 shingles valued at $45,901, and cut in 1914, were principally chestnut, with a small amount of white pine in the western part of the State and cypress in the southeastern section. All except three counties of the State reported a cut of shingles, but in only three of them did the cut exceed 1,000,000, viz.: Montgomery, Frederick and Howard, in which all the shingles were chestnut. These were cut either by portable sawmills, many of which are equipped for their manufacture, or by individually operated shingle machines.

LATH.

A total of 14,837,000 lath were cut in 1914, with a value of $45,282. The cut was distributed over nearly all of the counties, Allegany, Dorchester, Garrett, Wicomico and Worcester each reporting a million or more. Pine was the species almost universally used, and in nearly every case the lath were cut from material not suited for lumber, so that they may be regarded as more or less a by-product of the lumber mills.

MINE TIES.

This product is only reported from the three westernmost counties of the State, in the mining region. The total output was

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260,000, valued at $39,000. Low-grade material too small for saw timber was generally used. A variety of species enter into the product, but the principal kinds are birch, maple and several kinds of oak, the latter supplying the bulk of the cut.

POSTS.

The total production—133,645 posts, valued at $20,587—was a local product reported in nearly every county of the State. Most of them were sold locally and consisted principally of locust, cedar and chestnut.

EXPORT LOGS.

This product consists of large, choice logs of walnut, poplar, oak and a few other valuable species, culled from the forests, shipped to Baltimore, and there exported in the rough. The production reported recently is 329,000 board feet annually, valued at $9,870. It is shipped in the log, because it takes a lower customs duty and is the more readily available for the various forms into which it is finally manufactured. Most of it is used for veneer, except walnut, which is largely and increasingly used for gun stocks. Six counties within a radius of 50 miles of Baltimore reported shipment of export logs in 1914.

PINWOOD.

The only county in the State to report this product was Washington County, with 440 cords valued at $3,960. For this purpose locust is used, cut into lengths of approximately four feet, and sold by the cord to a large establishment at Hagerstown, which produces considerable quantities of insulator pins. Though red oak also is somewhat used, black locust constitutes the chief source of the telegraph pin manufacturer's wood supply.

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SPECIAL USES OF THE FOREST.

Among the special uses of the forests not directly associated with timber production are the growing of basket willows, the production of maple syrup and sugar, and the manufacture of charcoal. These are all uses and products that may more properly be classed under the forest than any other division, and while they are somewhat localized, they nevertheless comprise important industries.

WILLOW PRODUCTION.

The growing of basket willows is an important industry in the vicinity of Baltimore. The other centers are Lansdowne, Halethorpe, Elkridge and Laurel, with scattered plantations at Frederick, Rosedale, Catonsville and Crownsville. Three kinds of willow are used—the Lemley, American green and Welsh— and instead of being permitted to grow to tree form they are annually cut back to near the surface of the ground. The rods which represent a season's growth are from 4 to 10 feet in length, are cut during the winter, peeled and sold to basket makers and dealers by the pound. The production reported in 1914 amounted to 400,000 pounds, valued at $30,000.

MAPLE SYRUP AND SUGAR.

The sugar maple is a tree indigenous to mountain sections, occurring locally over restricted areas in Garrett County. The principal stands are in the vicinity of Grantsville and Bittinger, with very much smaller ones near Hoyes Run and the southwestern part of the county. It is the practice in these sections in cutting woodlands where sugar maple constitutes a considerable percentage of the stand, to take out all but these trees, which then are left in the form of sugar groves or "camps." More recently, however, advancing prices paid for sugar maple timber have resulted in the cutting down of many of these fine old groves.

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The maple trees, of course, are tapped each spring, the amount of sugar or syrup produced depending upon the season. The Census reported for 1909 a production of 351,908 pounds of sugar, valued at $24,985, and 12,172 gallons of syrup worth $9,401, making a total of $34,386 for the product of approximately 80,000 trees. It is probable that this production has been maintained on an average since 1909, and the value of the product has increased because of the higher price now obtaining for both sugar and syrup.

CHARCOAL.

The production of charcoal is not as important as it was some years ago, due to changes in the industries in which it was formerly used. But three counties—Anne Arundel, Cecil and Charles—reported a production which amounted to 95,000 bushels, valued at $9,500. Up to fifty years ago, and for more than a century before, the cutting of wood for charcoal production was a very important business, as it was then used extensively in iron manufacture in several different sections of the State.

For example, the Principio Furnace, which is, except for the Muirkirk Furnace in Prince George's County, the only one now operated in the State though to a very limited extent, formerly used large quantities of the charcoal produced from its 10,000 acres of woodland. The Principio Company was organized in 1722, and in 1774 the Catoctin Furnace, in the mountains of the same name, was built. The latter ceased to operate about 20 years ago, though it also had large holdings of woodland comprising nearly 10,000 acres, which it had cut over periodically for charcoal production. The Green Spring Furnace, in the vicinity of Fairview Mountain, likewise discontinued operations, in 1873, but during its active period, covering 25 years, it used the entire product of its 7,000 acres of woodland for charcoal production. Harford Furnace, on a branch of Bush River; another, at The Rocks in Harford County; and still other smaller ones, all contributed to the charcoal industry.

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TABLE A—THE STATE'S FOREST AREAS, CLASSIFIED BY STAND OF TIMBER PER ACRE.

County.	Mixed Hardwoods.			Pine.			Hardwood and Pine.		
	Over 5,000 Bd. Ft.	Under 5,000 Bd. Ft.	Per Cent.	Over 5,000 Bd. Ft.	Under 5,000 Bd. Ft.	Per Cent.	Over 5,000 Bd. Ft.	Under 5,000 Bd. Ft.	Per Cent.
	Acres.	Acres.		Acres.	Acres.		Acres.	Acres.	
Allegany	274	128,148	78	6	3,158	2	442	31,904	20
Anne Arundel	6,744	61,178	74	8,430	9,085	19	------	6,829	7
Baltimore	4,301	94,659	96	601	144	1	------	3,810	3
Calvert	8,251	39,489	76	40	10,482	17	------	4,128	7
Caroline	1,861	19,775	34	1,825	19,206	34	------	20,167	32
Carroll	3,582	35,401	99	------	--------	----	------	359	1
Cecil	2,738	50,805	100	------	--------	----	------	--------	----
Charles	6,868	66,037	43	5,243	13,609	11	------	79,790	46
Dorchester	2,458	16,395	14	8,182	40,582	35	27,115	43,559	51
Frederick	3,300	87,358	99	------	62	----	------	397	1
Garrett	4,484	264,112	98	1,464	617	1	2,529	1,277	1
Harford	6,303	75,234	99	------	335	1	------	--------	----
Howard	9,399	27,709	96	------	1,536	4	------	--------	----
Kent	6,787	26,063	97	------	443	1	------	483	2
Montgomery	4,823	59,416	94	272	2,306	4	------	1,504	2
Prince George's	3,122	89,124	73	------	23,755	18	------	12,199	10
Queen Anne's	------	55,359	94	166	1,840	3	31	1,874	3
St. Mary's	1,471	35,496	31	1,919	22,080	20	------	58,164	49
Somerset	------	7,101	10	7,896	20,843	42	5,601	26,946	48
Talbot	441	8,251	19	6,942	5,185	26	1,573	23,430	55
Washington	4,022	56,160	83	------	599	1	------	11,493	16
Wicomico	112	24,852	23	7,018	35,596	38	1,270	42,760	39
Worcester	15,869	18,241	22	7,902	77,387	59	------	28,783	19
The State	96,060	1,346,363	65	57,906	289,300	15	38,561	399,856	20

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TABLE B—SUMMARY OF THE 1914 LUMBER AND TIMBER PRODUCTION OF MARYLAND, BY COUNTIES.

County.	Mills and Operators.	Cut in Cubic Feet.	Value.
Allegany	45	3,141,400	$440,754
Anne Arundel	22	1,099,610	130,099
Baltimore	30	2,119,584	308,186
Calvert	20	1,448,475	202,597
Caroline	61	1,546,000	178,654
Carroll	25	991,960	118,800
Cecil	24	716,780	96,893
Charles	30	5,838,080	484,866
Dorchester	37	2,231,160	352,405
Frederick	51	809,965	179,004
Garrett	62	7,750,245	1,379,937
Harford	27	774,555	118,342
Howard	12	599,455	64,696
Kent	10	382,870	53,047
Montgomery	28	1,215,545	175,422
Prince George's	32	1,388,000	161,939
Queen Anne's	26	690,205	83,363
St. Mary's	33	1,226,755	157,002
Somerset	46	2,742,423	363,174
Talbot	38	1,274,994	137,212
Washington	26	1,485,950	190,850
Wicomico	64	3,949,470	592,318
Worcester	51	3,525,700	467,191
The State	800	46,949,181	$6,436,751

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